

# *IES-612-51*

*12-port ADSL2/2+ Standalone mini-DSLAM*

## *User's Guide*

Version 3.52  
10/2007  
Edition 1

### **DEFAULT LOGIN**

<b>IP Address</b>	<b>http://192.168.1.1</b>
<b>User Name</b>	<b>admin</b>
<b>Password</b>	<b>1234</b>





# About This User's Guide

## Intended Audience

This manual is intended for people who want to configure the IES-612-51 using the web configurator. You should have at least a basic knowledge of TCP/IP networking concepts and topology.

## Related Documentation

- Quick Start Guide  
The Quick Start Guide is designed to help you get up and running right away. It contains information on setting up your network and configuring for Internet access.
- Web Configurator Online Help  
Embedded web help for descriptions of individual screens and supplementary information.
- Command Reference Guide  
The Command Reference Guide explains how to use the Command-Line Interface (CLI) and CLI commands to configure the IES-612-51.



---

It is recommended you use the web configurator to configure the IES-612-51.

---

- Supporting Disk  
Refer to the included CD for support documents.
- ZyXEL Web Site  
Please refer to [www.zyxel.com](http://www.zyxel.com) for additional support documentation and product certifications.

## User Guide Feedback

Help us help you. Send all User Guide-related comments, questions or suggestions for improvement to the following address, or use e-mail instead. Thank you!

The Technical Writing Team,  
ZyXEL Communications Corp.,  
6 Innovation Road II,  
Science-Based Industrial Park,  
Hsinchu, 300, Taiwan.

E-mail: [techwriters@zyxel.com.tw](mailto:techwriters@zyxel.com.tw)

# Document Conventions

## Warnings and Notes

These are how warnings and notes are shown in this User's Guide.



---

Warnings tell you about things that could harm you or your IES-612-51.

---



---

Notes tell you other important information (for example, other things you may need to configure or helpful tips) or recommendations.






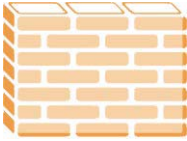



---

## Syntax Conventions

- The IES-612-51 may be also referred to as the “device”, the “system” or the “product” in this User's Guide.
- Product labels, screen names, field labels and field choices are all in **bold** font.
- A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the “enter” or “return” key on your keyboard.
- “Enter” means for you to type one or more characters and then press the [ENTER] key. “Select” or “choose” means for you to use one of the predefined choices.
- A right angle bracket ( > ) within a screen name denotes a mouse click. For example, **Maintenance > Log > Log Setting** means you first click **Maintenance** in the navigation panel, then the **Log** sub menu and finally the **Log Setting** tab to get to that screen.
- Units of measurement may denote the “metric” value or the “scientific” value. For example, “k” for kilo may denote “1000” or “1024”, “M” for mega may denote “1000000” or “1048576” and so on.
- “e.g.” is a shorthand for “for instance”, and “i.e.” means “that is” or “in other words”.

## Icons Used in Figures

Figures in this User's Guide may use the following generic icons. The IES-612-51 icon is not an exact representation of your IES-612-51.

IES-612-51 	Computer 	Notebook computer 
Server 	DSLAM 	Firewall 
Telephone 	Switch 	Router 

# Safety Warnings



---

For your safety, be sure to read and follow all warning notices and instructions.

---

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- ONLY qualified service personnel should service or disassemble this device.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device. Connect it to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Use ONLY power wires of the appropriate wire gauge (see [Chapter 58 on page 385](#) for details) for your device. Connect it to a power supply of the correct voltage (see [Section on page 385](#) for details).
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the device and the power source.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- Use only No. 26 AWG (American Wire Gauge) or larger telecommunication line cord.
- Fuse Warning! Replace a fuse only with a fuse of the same type and rating.
- The length of exposed (bare) power wire should not exceed 7 mm.

This product is recyclable. Dispose of it properly.







# Contents Overview

<b>Introduction .....</b>	<b>39</b>
Getting to Know the IES-612-51 .....	41
Hardware Installation .....	45
Front Panel .....	49
<b>Basic Settings .....</b>	<b>59</b>
Introducing the Web Configurator .....	61
Initial Configuration .....	69
Home and Port Statistics Screens .....	75
System Information .....	87
General Setup .....	91
User Account .....	93
Switch Setup .....	97
IP Setup .....	103
ENET Port Setup .....	105
xDSL Port Setup .....	107
xDSL Profiles Setup .....	125
xDSL Line Data .....	137
<b>Advanced Application .....</b>	<b>143</b>
VLAN .....	145
IGMP .....	153
Static Multicast .....	163
Multicast VLAN .....	165
Filtering .....	171
MAC Filter .....	173
Spanning Tree Protocol .....	175
Port Authentication .....	181
Port Security .....	185
DHCP Relay .....	187
DHCP Snoop .....	191
RFC 2684 Routed Mode .....	195
PPPoA to PPPoE .....	203
DSCP .....	209
TLS PVC .....	211
ACL .....	215
Downstream Broadcast .....	221

Syslog .....	223
Access Control .....	225
<b>Routing Protocol, Alarm and Management .....</b>	<b>233</b>
Static Routing .....	235
Maintenance .....	237
Diagnostic .....	241
MAC Table .....	245
ARP Table .....	247
Alarm .....	249
<b>CLI Commands .....</b>	<b>255</b>
How to Access and Use the CLI .....	257
Common Commands .....	263
System Commands .....	267
Alarm Commands .....	275
DHCP Commands .....	281
IEEE 802.1Q Tagged VLAN and Isolation Commands .....	287
MAC Commands .....	295
IGMP Commands .....	299
Packet Filter Commands .....	309
Switch and Statistics Commands .....	313
IP Commands .....	317
IP Bridge Commands .....	321
SNMP Commands .....	323
ADSL Commands .....	325
Virtual Channel Commands .....	353
ACL Commands .....	369
<b>Troubleshooting and Specifications .....</b>	<b>373</b>
Troubleshooting .....	375
Product Specifications .....	385
<b>Appendices and Index .....</b>	<b>395</b>

# Table of Contents

<b>About This User's Guide .....</b>	<b>3</b>
<b>Document Conventions.....</b>	<b>4</b>
<b>Safety Warnings.....</b>	<b>6</b>
<b>Contents Overview .....</b>	<b>9</b>
<b>Table of Contents.....</b>	<b>11</b>
<b>List of Figures .....</b>	<b>27</b>
<b>List of Tables.....</b>	<b>33</b>
 <b>Part I: Introduction.....</b>	 <b>39</b>
 <b>Chapter 1</b>	
<b>Getting to Know the IES-612-51.....</b>	<b>41</b>
1.1 Overview .....	41
1.2 Applications .....	41
1.2.1 MTU Application .....	41
1.2.2 Curbside Application .....	42
1.3 Ways to Manage the IES-612-51 .....	43
1.4 Good Habits for Managing the IES-612-51 .....	43
 <b>Chapter 2</b>	
<b>Hardware Installation.....</b>	<b>45</b>
2.1 General Installation Instructions .....	45
2.2 Installation Scenarios .....	45
2.2.1 Desktop Installation Procedure .....	45
2.2.2 Rack-Mounted Installation .....	46
2.3 Connecting the Frame Ground .....	48
 <b>Chapter 3</b>	
<b>Front Panel .....</b>	<b>49</b>
3.1 Front Panel .....	49
3.1.1 Front Panel Ports .....	49
3.2 LEDs .....	50
3.2.1 Console Port .....	50

3.2.2 LAN Port (Ethernet) Connection .....	51
3.2.3 Notes About MDFs (Main Distribution Frames) .....	51
3.2.4 Telco-50 Cables .....	51
3.2.5 Telco-50 Connections .....	52
3.2.6 ADSL Connections .....	52
3.2.7 Typical MDF Scenarios .....	53
 <b>Part II: Basic Settings .....</b>	<b>59</b>
 <b>Chapter 4</b>	
<b>Introducing the Web Configurator .....</b>	<b>61</b>
4.1 Web Configurator Overview .....	61
4.2 Screen Privilege Levels .....	61
4.3 Accessing the Web Configurator .....	61
4.4 Navigation Panel .....	63
4.5 Changing Your Password .....	65
4.6 Saving Your Configuration .....	66
4.7 Logging Out of the Web Configurator .....	66
 <b>Chapter 5</b>	
<b>Initial Configuration .....</b>	<b>69</b>
5.1 Initial Configuration Overview .....	69
5.2 Initial Configuration .....	69
 <b>Chapter 6</b>	
<b>Home and Port Statistics Screens.....</b>	<b>75</b>
6.1 Home Screen .....	75
6.1.1 Ethernet Port Statistics Screen .....	76
6.1.2 DSL Port Statistics Screen .....	79
6.1.3 RMON Statistics Screen .....	81
6.1.4 RMON History Screen .....	83
6.1.5 RMON History Detail Screen .....	84
 <b>Chapter 7</b>	
<b>System Information .....</b>	<b>87</b>
 <b>Chapter 8</b>	
<b>General Setup.....</b>	<b>91</b>
 <b>Chapter 9</b>	
<b>User Account.....</b>	<b>93</b>
9.1 User Account Screen .....	93
9.2 Authentication Screen .....	94

<b>Chapter 10</b>	
<b>Switch Setup .....</b>	<b>97</b>
10.1 GARP Timer Setup .....	97
10.2 Switch Modes .....	97
10.2.1 Standalone Switch Mode .....	97
10.2.2 Port Isolation with Standalone Switch Mode Example .....	98
10.2.3 Daisychain Switch Mode .....	98
10.2.4 Port Isolation with Daisychain Switch Mode Example .....	98
10.3 Switch Setup Screen .....	99
<b>Chapter 11</b>	
<b>IP Setup.....</b>	<b>103</b>
<b>Chapter 12</b>	
<b>ENET Port Setup .....</b>	<b>105</b>
<b>Chapter 13</b>	
<b>xDSL Port Setup.....</b>	<b>107</b>
13.1 ADSL Standards Overview .....	107
13.2 Downstream and Upstream .....	107
13.3 Profiles .....	107
13.4 Interleave Delay .....	108
13.4.1 Fast Mode .....	108
13.5 Configured Versus Actual Rate .....	108
13.6 Default Settings .....	109
13.7 xDSL Port Setup Screen .....	109
13.7.1 xDSL Port Setting Screen .....	111
13.8 Virtual Channels .....	115
13.8.1 Super Channel .....	115
13.8.2 LLC .....	116
13.8.3 VC Mux .....	116
13.8.4 Virtual Channel Profile .....	116
13.9 VC Setup Screen .....	116
13.10 Priority-based PVCs .....	120
13.11 PPVC Setup Screen .....	121
13.11.1 PPVC Setup Members Screen .....	122
<b>Chapter 14</b>	
<b>xDSL Profiles Setup.....</b>	<b>125</b>
14.1 Port Profile Screen .....	125
14.2 ATM QoS .....	127
14.3 Traffic Shaping .....	128
14.3.1 ATM Traffic Classes .....	128
14.3.2 Traffic Parameters .....	128

14.4 Upstream Policing .....	130
14.5 VC Profile Screen .....	131
14.6 Alarm Profile Screen .....	133
14.7 IGMP Filtering .....	134
14.8 IGMP Filter Profile Screen .....	135
<b>Chapter 15</b>	
<b>xDSL Line Data.....</b>	<b>137</b>
15.1 xDSL Line Rate Info Screen .....	137
15.2 xDSL Performance Screen .....	138
15.3 xDSL Line Data Screen .....	140
 <b>Part III: Advanced Application .....</b>	 <b>143</b>
<b>Chapter 16</b>	
<b>VLAN .....</b>	<b>145</b>
16.1 Introduction to VLANs .....	145
16.2 Introduction to IEEE 802.1Q Tagged VLAN .....	145
16.2.1 Forwarding Tagged and Untagged Frames .....	146
16.3 VLAN Status Screen .....	146
16.4 Static VLAN Setting Screen .....	148
16.5 VLAN Port Setting Screen .....	149
<b>Chapter 17</b>	
<b>IGMP.....</b>	<b>153</b>
17.1 IGMP .....	153
17.2 IP Multicast Addresses .....	153
17.2.1 IGMP Snooping .....	153
17.2.2 IGMP Proxy .....	153
17.3 IGMP Status Screen .....	154
17.4 IGMP Bandwidth Screen .....	156
17.4.1 Bandwidth Port Setup Screen .....	157
17.5 IGMP Setup Screen .....	158
17.6 IGMP Filter Setup Screen .....	159
17.7 IGMP Count Screen .....	159
17.8 IGMP Port Info Screen .....	160
17.9 IGMP Port Group Screen .....	160
<b>Chapter 18</b>	
<b>Static Multicast.....</b>	<b>163</b>
18.1 Static Multicast .....	163

18.2 Static Multicast Screen .....	163
<b>Chapter 19</b>	
<b>Multicast VLAN.....</b>	<b>165</b>
19.1 Multicast VLAN Overview .....	165
19.2 MVLAN Status Screen .....	165
19.3 MVLAN Setup Screen .....	166
19.4 MVLAN Group Screen .....	168
<b>Chapter 20</b>	
<b>Filtering.....</b>	<b>171</b>
20.1 Packet Filter Screen .....	171
<b>Chapter 21</b>	
<b>MAC Filter .....</b>	<b>173</b>
21.1 MAC Filter Introduction .....	173
21.2 MAC Filter Screen .....	173
<b>Chapter 22</b>	
<b>Spanning Tree Protocol.....</b>	<b>175</b>
22.1 RSTP and STP .....	175
22.2 Spanning Tree Protocol Status Screen .....	177
22.3 Spanning Tree Protocol Screen .....	178
<b>Chapter 23</b>	
<b>Port Authentication.....</b>	<b>181</b>
23.1 Introduction to Authentication .....	181
23.1.1 RADIUS .....	181
23.1.2 Introduction to Local User Database .....	181
23.2 RADIUS Screen .....	182
23.3 802.1x Screen .....	183
<b>Chapter 24</b>	
<b>Port Security.....</b>	<b>185</b>
24.1 Port Security Overview .....	185
24.2 Port Security Screen .....	185
<b>Chapter 25</b>	
<b>DHCP Relay .....</b>	<b>187</b>
25.1 DHCP Relay .....	187
25.2 DHCP Relay Agent Information Option (Option 82) .....	187
25.2.1 DHCP Relay Agent Circuit ID and Remote ID Sub-option Formats .....	187
25.3 DHCP Relay Screen .....	188

<b>Chapter 26</b>	
<b>DHCP Snoop.....</b>	<b>191</b>
26.1 DHCP Snoop Overview .....	191
26.2 DHCP Snoop Screen .....	191
26.3 DHCP Snoop Status Screen .....	192
26.4 DHCP Counter Screen .....	193
<b>Chapter 27</b>	
<b>RFC 2684 Routed Mode.....</b>	<b>195</b>
27.1 RFC 2684 Routed Mode .....	195
27.1.1 RFC 2684 Routed Mode Example .....	195
27.2 2684 Routed PVC Screen .....	196
27.3 2684 Routed Domain Screen .....	198
27.4 RPVC Arp Proxy Screen .....	199
27.5 2684 Routed Gateway Screen .....	200
<b>Chapter 28</b>	
<b>PPPoA to PPPoE.....</b>	<b>203</b>
28.1 PPPoA to PPPoE Overview .....	203
28.2 PPPoA to PPPoE Screen .....	203
28.3 PPPoA to PPPoE Status Screen .....	206
<b>Chapter 29</b>	
<b>DSCP .....</b>	<b>209</b>
29.1 DSCP Overview .....	209
29.2 DSCP Setup Screen .....	209
29.3 DSCP Map Screen .....	210
<b>Chapter 30</b>	
<b>TLS PVC.....</b>	<b>211</b>
30.1 Transparent LAN Service (TLS) Overview .....	211
30.1.1 TLS Network Example .....	211
30.2 TLS PVC Screen .....	212
<b>Chapter 31</b>	
<b>ACL.....</b>	<b>215</b>
31.1 Access Control Logic (ACL) Overview .....	215
31.1.1 ACL Profile Rules .....	215
31.1.2 ACL Profile Actions .....	216
31.2 ACL Setup Screen .....	216
31.3 ACL Profile Setup Screen .....	218
31.4 ACL Profile Map Screen .....	219



<b>Chapter 32</b>	
<b>Downstream Broadcast.....</b>	<b>221</b>
32.1 Downstream Broadcast .....	221
32.2 Downstream Broadcast Screen .....	221
<b>Chapter 33</b>	
<b>Syslog .....</b>	<b>223</b>
33.1 Syslog .....	223
33.2 SysLog Screen .....	223
<b>Chapter 34</b>	
<b>Access Control.....</b>	<b>225</b>
34.1 Access Control Screen .....	225
34.2 Access Control Overview .....	225
34.3 SNMP .....	225
34.3.1 Supported MIBs .....	227
34.3.2 SNMP Traps .....	227
34.4 SNMP Screen .....	228
34.5 Service Access Control Screen .....	229
34.6 Remote Management Screen .....	230
 <b>Part IV: Routing Protocol, Alarm and Management.....</b>	 <b>233</b>
<b>Chapter 35</b>	
<b>Static Routing.....</b>	<b>235</b>
<b>Chapter 36</b>	
<b>Maintenance .....</b>	<b>237</b>
36.1 Maintenance Screen .....	237
36.2 Firmware Upgrade Screen .....	237
36.3 Restore Configuration Screen .....	238
36.4 Backing Up a Configuration File .....	238
36.5 Load Factory Defaults .....	239
36.6 Reboot System .....	240
36.7 Command Line FTP .....	240
<b>Chapter 37</b>	
<b>Diagnostic.....</b>	<b>241</b>
37.1 Diagnostic Screen .....	241
<b>Chapter 38</b>	
<b>MAC Table.....</b>	<b>245</b>

38.1 Introduction to MAC Table .....	245
38.2 MAC Table Screen .....	246
<b>Chapter 39</b>	
<b>ARP Table .....</b>	<b>247</b>
39.1 Introduction to ARP Table .....	247
39.1.1 How ARP Works .....	247
39.2 ARP Table Screen .....	247
<b>Chapter 40</b>	
<b>Alarm .....</b>	<b>249</b>
40.1 Alarm .....	249
40.2 Alarm Status Screen .....	249
40.3 Alarm Descriptions .....	250
40.4 Alarm Event Setup Screen .....	251
40.4.1 Edit Alarm Event Setup Screen .....	253
40.5 Alarm Port Setup Screen .....	254
 <b>Part V: CLI Commands .....</b>	 <b>255</b>
<b>Chapter 41</b>	
<b>How to Access and Use the CLI .....</b>	<b>257</b>
41.1 Accessing the CLI .....	257
41.1.1 Console Port .....	257
41.1.2 Telnet .....	257
41.1.3 SSH .....	258
41.2 Logging in .....	258
41.3 Command Conventions .....	258
41.4 Using Shortcuts and Getting Help .....	260
41.5 Command Privilege Levels .....	260
41.6 Saving Your Configuration .....	261
41.7 Logging Out .....	261
<b>Chapter 42</b>	
<b>Common Commands .....</b>	<b>263</b>
42.1 Port Selection .....	263
42.2 IP Status .....	264
42.3 Configuration Status .....	264
42.4 Reset to Defaults .....	265
42.5 Port and VLAN Isolation .....	265
42.5.1 Isolation Show Command .....	265

42.5.2 Port Isolation Enable Command .....	265
42.5.3 Port Isolation Disable Command .....	265
42.6 Statistics Monitor Command .....	266
42.7 Statistics Port Command .....	266
<b>Chapter 43</b>	
<b>System Commands.....</b>	<b>267</b>
43.1 System Commands .....	267
43.1.1 Idle Timeout Set Command Example .....	269
43.1.2 Basic System Information Command Examples .....	269
43.1.3 Logs Command Examples .....	270
43.1.4 Clearing the Log .....	273
<b>Chapter 44</b>	
<b>Alarm Commands .....</b>	<b>275</b>
44.1 General Alarm Command Parameters .....	275
44.2 Alarm Commands .....	275
44.2.1 Alarm Show Command Example .....	277
44.2.2 Alarm Port Show Command Example .....	278
44.2.3 Alarm Port Set Command Example .....	278
44.2.4 Alarm Tablelist Command Example .....	279
44.2.5 Log Format .....	279
44.2.6 Alarm History Show Command Example .....	280
44.2.7 Alarm History Clear Command Example .....	280
44.2.8 Alarm XEdit Command Example .....	280
<b>Chapter 45</b>	
<b>DHCP Commands .....</b>	<b>281</b>
45.1 General DHCP Command Parameters .....	281
45.2 DHCP Relay Commands .....	281
45.2.1 Show Command Example .....	283
45.3 DHCP Relay Option 82 Sub-option 1 Commands .....	283
45.4 DHCP Relay Option 82 Sub-option 2 Commands .....	284
45.5 DHCP Snoop Commands .....	284
45.5.1 DHCP Snoop Enable Command Example .....	285
45.5.2 DHCP Snoop Show Command Example .....	285
45.5.3 DHCP Counter Statistics Command Example .....	285
45.5.4 DHCP Snoop Statistics Command Example .....	286
<b>Chapter 46</b>	
<b>IEEE 802.1Q Tagged VLAN and Isolation Commands .....</b>	<b>287</b>
46.1 IEEE 802.1Q Tagging Types .....	287
46.2 Filtering Databases .....	287

46.2.1 Static Entries (SVLAN Table) .....	287
46.3 IEEE VLAN1Q Tagged VLAN Configuration Commands .....	288
46.3.1 VLAN Port Show Command Example .....	289
46.3.2 VLAN PVID Command Example .....	289
46.3.3 VLAN Priority Command Example .....	289
46.3.4 VLAN Set Command Examples .....	290
46.3.5 VLAN Frame Type Command Example .....	290
46.3.6 VLAN CPU Show Command Example .....	290
46.3.7 VLAN CPU Set Command Example .....	291
46.3.8 Configuring Management VLAN Example .....	291
46.3.9 VLAN Delete Command Example .....	291
46.3.10 VLAN Show Command Example .....	292
46.4 VLAN Statistics Commands .....	292
46.5 GARP Timer Commands .....	292
46.6 Isolation Commands .....	292
 <b>Chapter 47</b>	
<b>MAC Commands .....</b>	<b>295</b>
47.1 MAC Filter Commands .....	295
47.1.1 MAC Filter Show Command Example .....	296
47.1.2 MAC Filter Enable Command Example .....	296
47.1.3 MAC Filter Disable Command Example .....	296
47.1.4 MAC Filter Mode Command Example .....	296
47.1.5 MAC Filter Set Command Example .....	296
47.1.6 MAC Filter Delete Command Example .....	296
47.2 MAC Count Commands .....	297
47.2.1 MAC Count Show Command Example .....	297
47.2.2 MAC Count Enable Command Example .....	297
47.2.3 MAC Count Disable Command Example .....	298
47.2.4 MAC Count Set Command Example .....	298
47.3 MAC Anti-Spoofing Commands .....	298
 <b>Chapter 48</b>	
<b>IGMP Commands .....</b>	<b>299</b>
48.1 IGMP Snooping Commands .....	299
48.1.1 IGMP Snoop Show Example .....	299
48.1.2 IGMP Snoop Enable Example .....	299
48.1.3 IGMP Snoop Disable Command Example .....	299
48.2 IGMP Filter Commands .....	300
48.2.1 IGMP Filter Show Command Example .....	300
48.2.2 IGMP Filter Set Command Example .....	300
48.2.3 IGMP Filter Profile Set Command Example .....	301
48.2.4 IGMP Filter Profile Delete Command Example .....	301

48.2.5 IGMP Filter Profile Show Command Example .....	301
48.3 IGMP Bandwidth Commands .....	301
48.4 IGMP Bandwidth Port Commands .....	302
48.4.1 IGMP Bandwidth Port Show Command Example .....	302
48.5 IGMP Count Limit Commands .....	303
48.5.1 IGMP Count Disable Command Example .....	303
48.5.2 IGMP Count Enable Command Example .....	303
48.5.3 IGMP Count Set Command Example .....	303
48.5.4 IGMP Count Show Command Example .....	304
48.6 IGMP Snoop Statistics Commands .....	304
48.6.1 IGMP Snoop Info Statistics Command Example .....	304
48.6.2 IGMP Group Statistics Command Example .....	305
48.6.3 IGMP Port Info Statistics Command Example .....	305
48.6.4 IGMP Port Group Statistics Command Example .....	305
48.7 Multicast VLAN Commands .....	305
48.7.1 Multicast VLAN Disable Command Example .....	306
48.7.2 Multicast VLAN Show Command Example .....	307
48.7.3 Multicast VLAN Group Set Command Example .....	307
<b>Chapter 49</b>	
<b>Packet Filter Commands .....</b>	<b>309</b>
49.1 Command Summary .....	309
49.1.1 Packet Filter Show Command Example .....	310
49.1.2 Packet Filter Set Command Example .....	311
49.1.3 Packet Filter PPPoE Only Command Example .....	311
<b>Chapter 50</b>	
<b>Switch and Statistics Commands.....</b>	<b>313</b>
50.1 IEEE 802.1x Commands .....	313
50.2 DSCP Commands .....	314
50.3 Ethernet Commands .....	314
50.4 Queuemap Commands .....	315
50.5 RSTP Commands .....	315
50.6 Static Multicast Commands .....	316
50.7 RMON Command .....	316
<b>Chapter 51</b>	
<b>IP Commands .....</b>	<b>317</b>
51.1 General IP Commands .....	317
51.1.1 IP Settings and Default Gateway Example .....	318
51.1.2 Route Show Command Example .....	318
51.1.3 ARP Show Command Example .....	318
51.2 Statistics IP Command Example .....	319

<b>Chapter 52</b>	
<b>IP Bridge Commands.....</b>	<b>321</b>
52.1 IP Bridge Command Input Values .....	321
<b>Chapter 53</b>	
<b>SNMP Commands .....</b>	<b>323</b>
53.1 SNMP Commands .....	323
<b>Chapter 54</b>	
<b>ADSL Commands.....</b>	<b>325</b>
54.1 ADSL Command Input Values .....	325
54.2 ADSL Commands .....	326
54.2.1 ADSL Show Command Example .....	330
54.2.2 ADSL Name Command Example .....	330
54.2.3 ADSL Tel Command Example .....	330
54.2.4 ADSL Loopback Command Example .....	330
54.2.5 ADSL Upstream PSD Command Example .....	330
54.2.6 ADSL Downstream PSD Command Example .....	331
54.2.7 ADSL Upstream Carrier Command Example .....	331
54.2.8 ADSL Downstream Carrier0 Command Example .....	331
54.2.9 ADSL Downstream Carrier1 Command Example .....	332
54.2.10 PMM Parameters Command Example .....	332
54.2.11 Impulse Noise Protection Command Example .....	333
54.3 ADSL Profile Commands .....	334
54.3.1 ADSL Profile Show Command Example .....	335
54.3.2 ADSL Profile Set Command Example .....	335
54.3.3 ADSL Profile Delete Command Example .....	336
54.3.4 ADSL Profile Map Command Example .....	336
54.4 Statistics ADSL Commands .....	337
54.4.1 ADSL Show Command Example .....	338
54.4.2 Linedata Command Example .....	339
54.4.3 ADSL Lineinfo Command Example .....	339
54.4.4 Lineperf Command Example .....	340
54.4.5 15 Minute Performance Command Example .....	342
54.4.6 1 Day Performance Command Example .....	343
54.4.7 Line Diagnostics Set Command Example .....	344
54.4.8 Line Diagnostics Get Command Example .....	344
54.4.9 Line Diagnostics Get 992.3 Command Example .....	346
54.4.10 SELT Diagnostic Set Command Example .....	347
54.4.11 SELT Diagnostic Get Command Example .....	348
54.4.12 Tone Diagnostics 992.3 Command Example .....	348
54.5 Alarm Profile Commands .....	350
54.5.1 Alarm Profile Show Command Example .....	351

54.5.2 Alarm Profile Set Command Example .....	351
54.5.3 Alarm Profile Delete Command Example .....	351
54.5.4 Alarm Profile Map Command Example .....	352
54.5.5 Alarm Profile Showmap Command Example .....	352
<b>Chapter 55</b>	
<b>Virtual Channel Commands .....</b>	<b>353</b>
55.1 Virtual Channel Command Input Values .....	353
55.2 Virtual Channel Profile Commands .....	354
55.2.1 Set Virtual Channel Profile Command .....	355
55.2.2 Delete Virtual Channel Profile Command .....	355
55.3 PVC Channels .....	356
55.3.1 PVC Set Command .....	356
55.4 Priority-based PVCs .....	356
55.4.1 PPVC Set Command Example .....	357
55.4.2 PPVC Member Set Command Example .....	357
55.4.3 PPVC Member Delete Command Example .....	358
55.4.4 PPVC Member Show Command Example .....	358
55.4.5 PPVC Show Command Example .....	358
55.4.6 PPVC Delete Command Example .....	358
55.5 2684 Routed Mode Commands .....	358
55.5.1 2684 Routed Mode Example .....	360
55.5.2 RPVC Gateway Set Command Example .....	361
55.5.3 RPVC Gateway Show Command Example .....	361
55.5.4 RPVC Gateway Delete Command Example .....	361
55.5.5 RPVC Set Command Example .....	362
55.5.6 RPVC Show Command Example .....	362
55.5.7 RPVC Delete Command Example .....	362
55.5.8 RPVC Route Set Command Example .....	362
55.5.9 RPVC Route Show Command Example .....	363
55.5.10 RPVC Route Delete Command Example .....	363
55.5.11 RPVC ARP Agingtime Set Command Example .....	363
55.5.12 RPVC ARP Agingtime Show Command Example .....	363
55.5.13 RPVC ARP Show Command Example .....	364
55.6 PPPoA to PPPoE (PAE) Translation .....	364
55.6.1 PAE PVC Set Command Example .....	365
55.6.2 PAE PVC Show Command Example .....	365
55.6.3 PAE PVC Session Command Example .....	366
55.6.4 PAE PVC Counter Command Example .....	366
55.7 Transparent LAN Service (TLS) .....	367
55.7.1 TLS PVC Set Command Example .....	368
55.7.2 TLS PVC Show Command Example .....	368

<b>Chapter 56</b>	
<b>ACL Commands .....</b>	<b>369</b>
56.1 ACL Profile Commands .....	369
56.1.1 ACL Profile Set Command Example .....	371
56.1.2 ACL Profile Show Map Command Example .....	371
56.1.3 ACL Profile Show Command Example .....	371
56.2 ACL Assignment Commands .....	371
56.2.1 ACL Assignment Set Command Example .....	372
56.2.2 ACL Assignment Show Command Example .....	372
<b>Part VI: Troubleshooting and Specifications .....</b>	<b>373</b>
<b>Chapter 57</b>	
<b>Troubleshooting.....</b>	<b>375</b>
57.1 The SYS LED Does Not Turn On .....	375
57.2 The ALM LED Is On .....	375
57.3 LAN Port LEDs Do Not Turn On .....	376
57.4 LAN Port Data Transmission .....	376
57.5 DSL Data Transmission .....	376
57.6 There Is No Voice on a DSL Connection .....	377
57.7 Testing Wiring .....	377
57.8 Local Server .....	379
57.9 Data Rate .....	379
57.10 Configured Settings .....	380
57.11 Password .....	380
57.12 System Lockout .....	380
57.13 SNMP .....	380
57.14 Telnet .....	381
57.15 Resetting the Defaults .....	381
57.15.1 Resetting the Defaults Via Command .....	381
57.15.2 Uploading the Default Configuration File .....	382
57.16 Recovering the Firmware .....	383
<b>Chapter 58</b>	
<b>Product Specifications .....</b>	<b>385</b>
58.1 Device Specifications .....	385
58.2 Firmware Features .....	386
58.3 Standards Supported .....	390
58.4 Default Settings .....	391
58.5 Hardware Telco-50 Connector Pin Assignments .....	393
58.6 Console Cable Pin Assignments .....	393



**Part VII: Appendices and Index ..... 395**

Appendix A Changing a Fuse ..... 397

Appendix B Legal Information ..... 399

Appendix C Customer Support..... 403

**Index..... 409**



# List of Figures

Figure 1 MTU Application .....	42
Figure 2 Curbside Application .....	42
Figure 3 Attaching Rubber Feet .....	46
Figure 4 Attaching Mounting Brackets and Screws .....	47
Figure 5 Rack Mounting .....	47
Figure 6 IES-612-51 Frame Ground .....	48
Figure 7 Front Panel: AC Input .....	49
Figure 8 Front Panel: DC Input .....	49
Figure 9 MDF Wiring .....	51
Figure 10 Telco-50 Cable with RJ-11 Connectors .....	52
Figure 11 Installation Overview .....	53
Figure 12 Installation Scenario A .....	54
Figure 13 One MDF for End-user and CO Connections .....	55
Figure 14 Installation Scenario B .....	56
Figure 15 Two Separate MDFs for End-user and CO Connections .....	57
Figure 16 Installation Scenario C .....	58
Figure 17 Login .....	62
Figure 18 Home .....	62
Figure 19 User Account .....	65
Figure 20 User Account .....	66
Figure 21 Logout .....	67
Figure 22 IP Setup .....	69
Figure 23 xDSL Port Setup .....	70
Figure 24 VC Setup .....	71
Figure 25 VC Setup, Delete .....	71
Figure 26 Select Ports .....	71
Figure 27 VC Setup .....	72
Figure 28 VC Setup .....	72
Figure 29 Select Ports .....	73
Figure 30 VC Setup .....	73
Figure 31 Config Save .....	73
Figure 32 Config Save, Save Successful .....	74
Figure 33 Home .....	75
Figure 34 Port Statistics (Ethernet) .....	77
Figure 35 Port Statistics (DSL) .....	80
Figure 36 Port Statistics (RMON) .....	82
Figure 37 Port Statistics (RMON History) .....	84
Figure 38 Port Statistics (RMON History Detail) .....	85

Figure 39 System Info .....	87
Figure 40 General Setup .....	91
Figure 41 User Account .....	93
Figure 42 Authentication .....	94
Figure 43 Port Isolation with Standalone Switch Mode Example .....	98
Figure 44 Port Isolation with Daisychain Switch Mode Example .....	99
Figure 45 Switch Setup .....	100
Figure 46 IP Setup .....	103
Figure 47 ENET Port Setup .....	105
Figure 48 xDSL Port Setup .....	109
Figure 49 Select Ports .....	110
Figure 50 xDSL Port Setting .....	112
Figure 51 VC Setup .....	117
Figure 52 Basic Setting, xDSL Port Setup, VC Setup, Delete .....	119
Figure 53 Select Ports .....	119
Figure 54 Select Ports .....	120
Figure 55 PPVC Setup .....	121
Figure 56 PPVC Setup, Edit .....	122
Figure 57 Port Profile .....	125
Figure 58 PCR, SCR and MBS in Traffic Shaping .....	129
Figure 59 TAT, CDVT and BT in Traffic Shaping .....	130
Figure 60 VC Profile .....	131
Figure 61 Alarm Profile .....	133
Figure 62 IGMP Filter Profile .....	135
Figure 63 xDSL Line Rate Info .....	137
Figure 64 xDSL Performance .....	139
Figure 65 xDSL Line Data .....	141
Figure 66 VLAN Status .....	147
Figure 67 Static VLAN Setting .....	148
Figure 68 VLAN Port Setting .....	150
Figure 69 Select Ports .....	151
Figure 70 IGMP Proxy Network Example .....	154
Figure 71 IGMP (Status) .....	155
Figure 72 IGMP Bandwidth .....	156
Figure 73 Bandwidth Port Setup .....	157
Figure 74 IGMP Setup .....	158
Figure 75 IGMP Count .....	159
Figure 76 IGMP Port Info .....	160
Figure 77 IGMP Port Group .....	160
Figure 78 Static Multicast .....	163
Figure 79 MVLAN Status .....	165
Figure 80 MVLAN Setup .....	167
Figure 81 MVLAN Group .....	168

Figure 82 Packet Filter .....	171
Figure 83 MAC Filter .....	173
Figure 84 STP Root Ports and Designated Ports .....	176
Figure 85 Spanning Tree Protocol Status .....	177
Figure 86 Spanning Tree Protocol .....	179
Figure 87 RADIUS Server .....	181
Figure 88 RADIUS .....	182
Figure 89 802.1x .....	183
Figure 90 Port Security .....	185
Figure 91 Select Ports .....	186
Figure 92 DHCP Relay Agent Circuit ID Sub-option Format .....	187
Figure 93 DHCP Relay Agent Remote ID Sub-option Format .....	188
Figure 94 DHCP Relay .....	188
Figure 95 DHCP Snoop .....	191
Figure 96 DHCP Snoop Status .....	192
Figure 97 DHCP Counter .....	193
Figure 98 RFC 2684 Routed Mode Example .....	196
Figure 99 RFC 2684 Routed PVC .....	197
Figure 100 2684 Routed Domain .....	198
Figure 101 RPVC Arp Proxy .....	200
Figure 102 2684 Routed Gateway .....	201
Figure 103 Mixed PPPoA-to-PPPoE Broadband Network Example .....	203
Figure 104 PPPoA to PPPoE .....	204
Figure 105 PPPoA to PPPoE Status .....	206
Figure 106 DSCP Setup .....	209
Figure 107 DSCP Map .....	210
Figure 108 Transparent LAN Service Network Example .....	212
Figure 109 TLS PVC .....	213
Figure 110 ACL Setup .....	217
Figure 111 ACL Profile Setup .....	218
Figure 112 ACL Profile Map .....	220
Figure 113 Downstream Broadcast .....	221
Figure 114 SysLog .....	223
Figure 115 Access Control .....	225
Figure 116 SNMP Management Model .....	226
Figure 117 SNMP .....	229
Figure 118 Service Access Control .....	230
Figure 119 Remote Management (Secured Client Setup) .....	231
Figure 120 Static Routing .....	235
Figure 121 Maintenance .....	237
Figure 122 Firmware Upgrade .....	238
Figure 123 Restore Configuration .....	238
Figure 124 Restore Default Configuration .....	239

Figure 125 Restore Factory Default Settings, Reboot .....	240
Figure 126 Reboot System .....	240
Figure 127 Diagnostic .....	241
Figure 128 MAC Table Filtering Flowchart .....	245
Figure 129 MAC Table .....	246
Figure 130 ARP Table .....	248
Figure 131 Alarm Status .....	249
Figure 132 Alarm Event Setup .....	252
Figure 133 Alarm Event Setup Edit .....	253
Figure 134 Alarm Port Setup .....	254
Figure 135 DHCP Snoop Statistics Command Example .....	286
Figure 136 ADSL Show Command Example .....	330
Figure 137 ADSL Name Command Example .....	330
Figure 138 ADSL Tel Command Example .....	330
Figure 139 ADSL Loopback Command Example .....	330
Figure 140 ADSL Upstream PSD Command Example .....	330
Figure 141 ADSL Downstream PSD Command Example .....	331
Figure 142 ADSL Upstream Carrier Command Example .....	331
Figure 143 ADSL Upstream Carrier Command Display Example .....	331
Figure 144 ADSL Downstream Carrier0 Command Example 1 .....	331
Figure 145 ADSL Downstream Carrier0 Command Display Example .....	331
Figure 146 ADSL Downstream Carrier0 Command Example 2 .....	332
Figure 147 ADSL Downstream Carrier1 Command Example 1 .....	332
Figure 148 ADSL Downstream Carrier1 Command Example 2 .....	332
Figure 149 ADSL Downstream Carrier1 Command Display Example .....	332
Figure 150 PMM Parameters Command Example .....	332
Figure 151 Impulse Noise Protection Command Example .....	333
Figure 152 ADSL Profile Show Command Example .....	335
Figure 153 ADSL Profile Set Command Example 1 .....	336
Figure 154 ADSL Profile Set Command Example 2 .....	336
Figure 155 ADSL Profile Delete Command Example .....	336
Figure 156 ADSL Profile Delete Command Example .....	336
Figure 157 ADSL Show Command Example .....	338
Figure 158 Linedata Command Example .....	339
Figure 159 ADSL Lineinfo Command Example .....	339
Figure 160 Lineperf Command Example .....	340
Figure 161 15 Minute Performance Command Example .....	342
Figure 162 1Day Performance Command Example .....	343
Figure 163 Line Diagnostics Set Command Example .....	344
Figure 164 Line Diagnostics Get Command Example .....	344
Figure 165 Line Diagnostics Get 992.3 Command Example .....	346
Figure 166 SELT Diagnostic Set Command Example .....	347
Figure 167 Line Diagnostics Get Command Example .....	348

Figure 168 Tone Diagnostics Command Example .....	348
Figure 169 Alarm Profile Show Command Example .....	351
Figure 170 Alarm Profile Set Command Example .....	351
Figure 171 Alarm Profile Delete Command Example .....	351
Figure 172 Alarm Profile Map Command Example .....	352
Figure 173 Alarm Profile Showmap Command Example .....	352
Figure 174 Set Virtual Channel Profile Command Example 1 .....	355
Figure 175 Set Virtual Channel Profile Command Example 2 .....	355
Figure 176 Set Virtual Channel Profile Command Example 3 .....	355
Figure 177 Delete Virtual Channel Profile Command Example .....	355
Figure 178 PVC Set Command Example .....	356
Figure 179 PPVC Set Command Example .....	357
Figure 180 PPVC Member Set Command Example .....	357
Figure 181 PPVC Member Delete Command Example .....	358
Figure 182 PPVC Member Show Command Example .....	358
Figure 183 PPVC Show Command Example .....	358
Figure 184 PPVC Delete Command Example .....	358
Figure 185 2684 Routed Mode Example .....	360
Figure 186 2684 Routed Mode Commands Example .....	361
Figure 187 RPVC Gateway Set Command Example .....	361
Figure 188 RPVC Gateway Show Command Example .....	361
Figure 189 RPVC Gateway Delete Command Example .....	361
Figure 190 RPVC Set Command Example .....	362
Figure 191 RPVC Show Command Example .....	362
Figure 192 RPVC Delete Command Example .....	362
Figure 193 RPVC Route Set Command Example .....	362
Figure 194 RPVC Route Show Command Example .....	363
Figure 195 RPVC Route Delete Command Example .....	363
Figure 196 RPVC ARP Agingtime Command Example .....	363
Figure 197 RPVC ARP Agingtime Show Command Example .....	363
Figure 198 RPVC ARP Agingtime Show Command Example .....	364
Figure 199 Mixed PPPoA-to-PPPoE Broadband Network Example .....	364
Figure 200 PAE PVC Set Command Example .....	365
Figure 201 PAE PVC Show Command Example .....	365
Figure 202 PAE PVC Session Command Example .....	366
Figure 203 PAE PVC Counter Command Example .....	366
Figure 204 TLS PVC Set Command Example .....	368
Figure 205 TLS PVC Show Command Example .....	368
Figure 206 Testing In-house Wiring .....	378
Figure 207 Resetting the Switch Via Command .....	381
Figure 208 Example Xmodem Upload .....	382
Figure 209 Example Xmodem Upload .....	383
Figure 210 Telco-50 Pin Assignments .....	393

Figure 211 Console Cable RJ-11 Male Connector .....	394
Figure 212 Console Cable DB-9 Female Connector .....	394



# List of Tables

Table 1 Front Panel Ports .....	49
Table 2 LEDs .....	50
Table 3 Navigation Panel Submenu Links .....	63
Table 4 Web Configurator Screens .....	63
Table 5 Home .....	75
Table 6 Port Statistics (Ethernet) .....	77
Table 7 Port Statistics (DSL) .....	80
Table 8 Port Statistics (RMON) .....	82
Table 9 Port Statistics (RMON History) .....	84
Table 10 Port Statistics (RMON History Detail) .....	85
Table 11 System Info .....	88
Table 12 General Setup .....	91
Table 13 User Account .....	93
Table 14 User Account .....	95
Table 15 Switch Setup .....	100
Table 16 IP Setup .....	103
Table 17 ENET Port Setup .....	105
Table 18 ADSL Standards Maximum Transfer Rates .....	107
Table 19 xDSL Port Setup .....	109
Table 20 xDSL Port Setting .....	112
Table 21 VC Setup .....	117
Table 22 IEEE 802.1p Priority to PPVC Mapping .....	120
Table 23 PPVC Setup .....	121
Table 24 PPVC Setup, Edit .....	123
Table 25 Port Profile .....	125
Table 26 VC Profile .....	131
Table 27 Alarm Profile .....	133
Table 28 IGMP Filter Profile .....	136
Table 29 xDSL Line Rate Info .....	137
Table 30 xDSL Performance .....	139
Table 31 xDSL Line Data .....	142
Table 32 VLAN Status .....	147
Table 33 Static VLAN Setting .....	148
Table 34 VLAN Port Setting .....	150
Table 35 IGMP (Status) .....	155
Table 36 IGMP Bandwidth .....	156
Table 37 Bandwidth Port Setup .....	158
Table 38 IGMP Setup .....	158

Table 39 IGMP Count .....	159
Table 40 IGMP Port Info .....	160
Table 41 IGMP Port Group .....	161
Table 42 Static Multicast .....	163
Table 43 MVLAN Status .....	166
Table 44 MVLAN Setup .....	167
Table 45 MVLAN Group .....	168
Table 46 Packet Filter .....	171
Table 47 MAC Filter .....	173
Table 48 Path Cost .....	175
Table 49 RSTP Port States .....	176
Table 50 Spanning Tree Protocol Status .....	177
Table 51 Spanning Tree Protocol .....	179
Table 52 RADIUS .....	182
Table 53 802.1x .....	183
Table 54 Port Security .....	185
Table 55 DHCP Relay .....	189
Table 56 DHCP Snoop .....	191
Table 57 DHCP Snoop Status .....	192
Table 58 DHCP Counter .....	193
Table 59 RFC 2684 Routed PVC .....	197
Table 60 2684 Routed Domain .....	199
Table 61 RPVC Arp Proxy .....	200
Table 62 2684 Routed Gateway .....	201
Table 63 PPPoA to PPPoE .....	204
Table 64 PPPoA to PPPoE Status .....	206
Table 65 DSCP Setup .....	209
Table 66 DSCP Map .....	210
Table 67 TLS PVC .....	213
Table 68 ACL Setup .....	217
Table 69 ACL Profile Setup .....	218
Table 70 ACL Profile Map .....	220
Table 71 Downstream Broadcast .....	221
Table 72 SysLog .....	223
Table 73 Access Control Summary .....	225
Table 74 SNMP Commands .....	226
Table 75 SNMPv2 Traps .....	227
Table 76 SNMP .....	229
Table 77 Service Access Control .....	230
Table 78 Remote Management (Secured Client Setup) .....	231
Table 79 Static Routing .....	235
Table 80 Diagnostic .....	242
Table 81 MAC Table .....	246

Table 82 ARP Table .....	248
Table 83 Alarm Status .....	249
Table 84 Alarm Descriptions .....	250
Table 85 Alarm Event Setup .....	252
Table 86 Alarm Event Setup Edit .....	253
Table 87 Alarm Port Setup .....	254
Table 88 Default Settings for the Console Port .....	257
Table 89 Default Management IP Address .....	257
Table 90 Default User Name and Password .....	258
Table 91 Table Title .....	259
Table 92 Common Command Input Values .....	259
Table 93 CLI Shortcuts and Help .....	260
Table 94 System Commands .....	267
Table 95 Log Format .....	270
Table 96 Log Messages .....	271
Table 97 General Alarm Command Parameters .....	275
Table 98 alarm Commands .....	275
Table 99 Log Format .....	279
Table 100 General DHCP Command Parameters .....	281
Table 101 DHCP Relay Commands .....	281
Table 102 DHCP Relay Option 82 Sub-option 1 Commands .....	283
Table 103 DHCP Relay Option 82 Sub-option 2 Commands .....	284
Table 104 DHCP Snoop Commands .....	284
Table 105 IEEE VLAN1Q Tagged VLAN Configuration Command Summary .....	288
Table 106 Statistics VLAN Command Summary .....	292
Table 107 GARP Timer Command Summary .....	292
Table 108 Isolation Command Summary .....	293
Table 109 MAC Filter Command Summary .....	295
Table 110 MAC Count Command Summary .....	297
Table 111 MAC Anti-Spoofing Command Summary .....	298
Table 112 igmpsnoop Command Summary .....	299
Table 113 igmpfilter Command Summary .....	300
Table 114 IGMP Bandwidth Command Summary .....	301
Table 115 IGMP Bandwidth Port Command Summary .....	302
Table 116 IGMP Count Limit Command Summary .....	303
Table 117 IGMP Snooping Statistics Command Summary .....	304
Table 118 Multicast VLAN Command Summary .....	306
Table 119 pktfilter Command Summary .....	309
Table 120 IEEE 802.1x Commands .....	313
Table 121 DSCP Commands .....	314
Table 122 Enet Commands .....	314
Table 123 Queuemap Commands .....	315
Table 124 RSTP Commands .....	315

Table 125 Static Multicast Commands .....	316
Table 126 RMON Command .....	316
Table 127 General IP Commands Input Values .....	317
Table 128 General IP Commands .....	317
Table 129 IP Bridge Command Input Values .....	321
Table 130 SNMP Commands Input Values .....	323
Table 131 SNMP Commands .....	323
Table 132 ADSL Command Input Values .....	325
Table 133 ADSL Commands .....	326
Table 134 ADSL Profile Commands .....	334
Table 135 ADSL Statistics Commands .....	337
Table 136 Line Performance Counters .....	341
Table 137 15 Minute Performance Counters .....	342
Table 138 Line Diagnostics Get Command .....	345
Table 139 Line Diagnostics Get 992.3 Command .....	346
Table 140 ToneDiag Command .....	349
Table 141 Alarm Profile Commands .....	350
Table 142 Virtual Channel Command Input Values .....	353
Table 143 Virtual Channel Profile Commands .....	354
Table 144 PVC Commands .....	356
Table 145 PPVC Commands .....	357
Table 146 RPVC Commands .....	359
Table 147 PAEPVC Commands .....	365
Table 148 TLS Commands .....	368
Table 149 ACL Command Input Values .....	369
Table 150 ACL Commands .....	370
Table 151 ACL Assignment Command Input Values .....	372
Table 152 ACL Assignment Commands .....	372
Table 153 SYS LED Troubleshooting .....	375
Table 154 ALM LED Troubleshooting .....	375
Table 155 10/100 LED Troubleshooting .....	376
Table 156 Troubleshooting Data Transmission .....	376
Table 157 DSL Data Transmission Troubleshooting .....	376
Table 158 DSL Voice Troubleshooting .....	377
Table 159 Wiring Tests .....	377
Table 160 Testing In-house Wiring .....	378
Table 161 Troubleshooting a Local Server .....	379
Table 162 Troubleshooting the SYNC-rate .....	379
Table 163 Troubleshooting the IES-612-51's Configured Settings .....	380
Table 164 Troubleshooting the SNMP Server .....	380
Table 165 Troubleshooting Telnet .....	381
Table 166 Hardware Specifications .....	385
Table 167 IES-612-51 Features .....	386

Table 168 Standards Supported .....	390
Table 169 Default Settings .....	391
Table 170 Hardware Telco-50 Connector Port and Pin Numbers .....	393
Table 171 Console Cable Connector Pin Assignments .....	394



---

# PART I

# Introduction

---

Getting to Know the IES-612-51 (41)

Hardware Installation (45)

Front Panel (49)





# Getting to Know the IES-612-51

This chapter introduces the main features and applications of your IES-612-51. It also introduces the ways you can manage the IES-612-51.

## 1.1 Overview

The IES-612-51 (Standalone mini-DSLAM) is an IP-based DSLAM. The IES-612-51 aggregates traffic from 12 ADSL lines to two Ethernet ports to connect ADSL subscribers to the Internet.

You can use the built-in web configurator to manage and configure the IES-612-51. In addition, the IES-612-51 can also be managed via Telnet, the console port, or third-party SNMP management.

See [Chapter 58 on page 385](#) for a complete list of features.

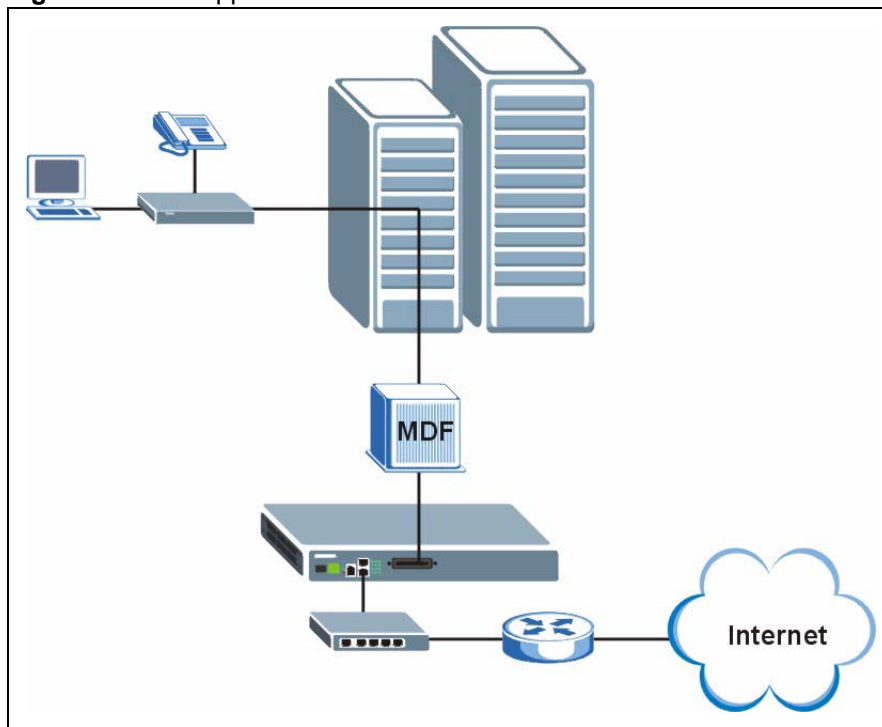
## 1.2 Applications

These are the main applications for the IES-612-51:

- Provide Internet access and multimedia services for Multiple Tenant Units (MTU).
- Other applications include telemedicine, surveillance systems, remote servers systems, cellular base stations and high-quality teleconferencing.

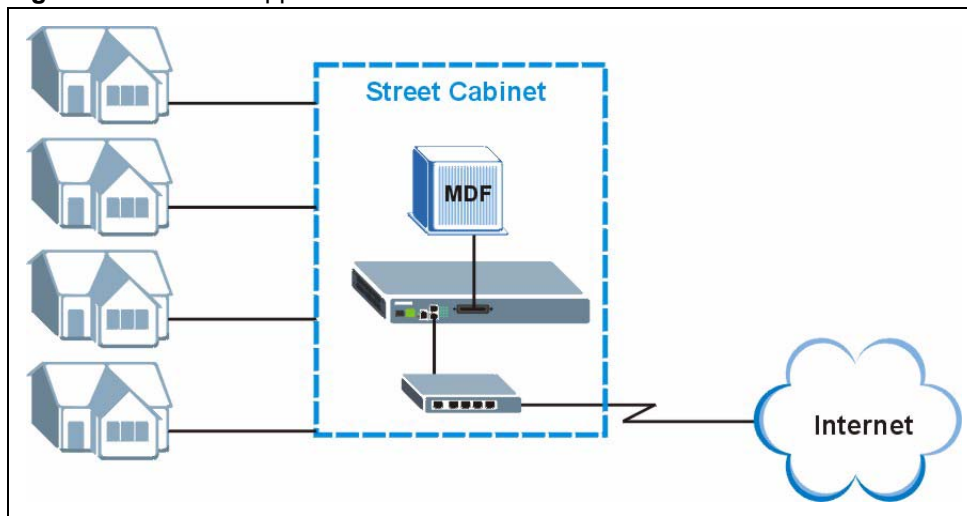
### 1.2.1 MTU Application

The following diagram depicts a typical application of the IES-612-51 with DSL modems in a large residential building or multiple tenant unit (MTU). This application leverages existing phone line wiring to provide Internet access to all tenants, and the tenants can continue to use the existing phone services.

**Figure 1** MTU Application

### 1.2.2 Curbside Application

The IES-612-51 can be used by an Internet Service Provider (ISP) in a street cabinet to form a "mini POP (Point-of-Presence)" to provide broadband services to residential areas that are too far away from the ISP to avail of DSL services. Residents need a DSL modem, connected as shown in the previous figure.

**Figure 2** Curbside Application

## 1.3 Ways to Manage the IES-612-51

Use any of the following methods to manage the IES-612-51.

- Web Configurator. This is recommended for everyday management of the IES-612-51 using a (supported) web browser. See [Chapter 4 on page 61](#).
- Command Line Interface. Line commands offer an alternative to the Web Configurator and may be necessary to configure advanced features. See [Chapter 41 on page 257](#).
- FTP. Use File Transfer Protocol for firmware upgrades and configuration backup/restore. See [Chapter 43 on page 267](#).
- SNMP. The IES-612-51 can be monitored and/or managed by an SNMP manager. See [Section 34.3 on page 225](#).

## 1.4 Good Habits for Managing the IES-612-51

Do the following things regularly to make the IES-612-51 more secure and to manage the IES-612-51 more effectively.

- Change the password. Use a password that's not easy to guess and that consists of different types of characters, such as numbers and letters.
- Write down the password and put it in a safe place.
- Back up the configuration (and make sure you know how to restore it). Restoring an earlier working configuration may be useful if the IES-612-51 becomes unstable or even crashes. If you forget your password, you will have to use the console port to reset the IES-612-51 to its factory default settings. If you backed up an earlier configuration file, you would not have to totally re-configure the IES-612-51. You could simply restore your last configuration.



# Hardware Installation

This chapter explains how to install the IES-612-51.

## 2.1 General Installation Instructions

Before you begin, read all the safety warnings in Safety Warnings on [page 6](#), and make sure you follow them.

Perform the installation as follows:

- 1 Make sure the IES-612-51 power is not connected.
- 2 Install the hardware. See [Section 2.1 on page 45](#).
- 3 Connect the frame ground. See [Section 2.3 on page 48](#).
- 4 See [Section 3.1 on page 49](#) for instructions on making front panel connections.
- 5 See [Section 3.2.5 on page 52](#) for instructions on connecting the Telco-50 connectors.

## 2.2 Installation Scenarios

The IES-612-51 can be placed on a desktop or rack-mounted on a standard EIA rack. Use the rubber feet in a desktop installation and the brackets in a rack-mounted installation.

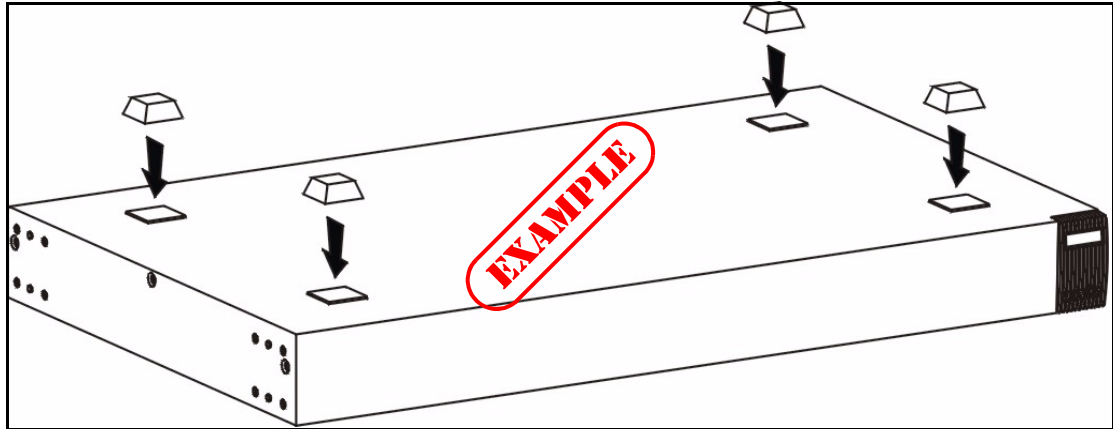
For proper ventilation, allow at least 4 inches (10 cm) of clearance at the front and 3.4 inches (8 cm) at the back of the IES-612-51. This is especially important for enclosed rack installations.

### 2.2.1 Desktop Installation Procedure

Do the following to install the IES-612-51 on top of a desk or table. The figures in this section are examples and are not intended as an exact representation of the IES-612-51.

- 1 Make sure the IES-612-51 is clean and dry.
- 2 Set the IES-612-51 on a smooth, level surface strong enough to support the weight of the IES-612-51 and the connected cables. Make sure there is a power outlet nearby.
- 3 Make sure there is enough clearance around the IES-612-51 to allow air circulation and the attachment of cables and the power cord.
- 4 Remove the adhesive backing from the rubber feet.
- 5 Attach the rubber feet to each corner on the bottom of the IES-612-51. These rubber feet help protect the IES-612-51 from shock or vibration and ensure space between IES-612-51 when stacking.

**Figure 3** Attaching Rubber Feet



---

Do not block the ventilation holes. Leave space between IES-612-51 when stacking.

---

## 2.2.2 Rack-Mounted Installation

### 2.2.2.1 Rack-mounted Installation Requirements

The IES-612-51 can be mounted on an EIA standard size, 19-inch rack or in a wiring closet with other equipment. Follow the steps below to mount your IES-612-51 on a standard EIA rack using a rack-mounting kit.



---

Make sure the rack will safely support the combined weight of all the equipment it contains.

---



---

Make sure the position of the IES-612-51 does not make the rack unstable or top-heavy. Take all necessary precautions to anchor the rack securely before installing the unit.

---

- Use a #2 Philips screwdriver to install the screws.
- See [Chapter 58 on page 385](#) for the gauge of wire to use for the frame ground connections.



---

Failure to use the proper screws may damage the unit.

---



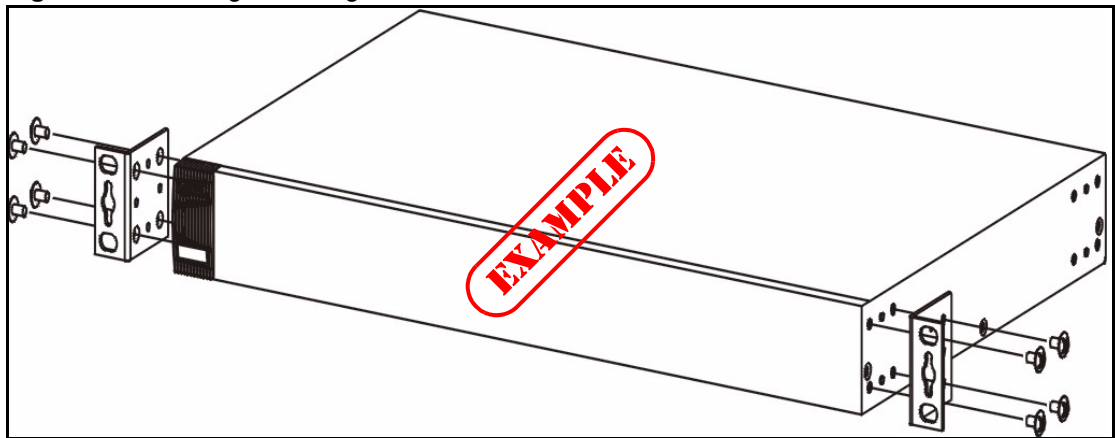
Do not block the ventilation holes. Leave space between devices when stacking.

### 2.2.2.2 Rack-Mounted Installation Procedure

Do the following to rack-mount the IES-612-51. The figures in this section are examples and are not intended as an exact representation of the IES-612-51.

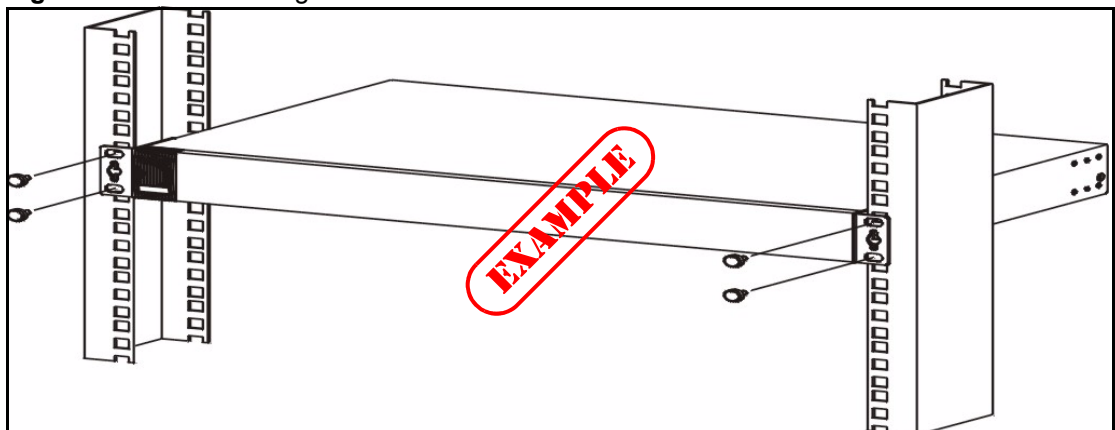
- 1 Align one bracket with the holes on one side of the IES-612-51 and secure it with the bracket screws smaller than the rack-mounting screws.
- 2 Attach the other bracket in a similar fashion.

**Figure 4** Attaching Mounting Brackets and Screws



- 3 After attaching both mounting brackets, position the IES-612-51 in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the IES-612-51 to the rack with the rack-mounting screws.

**Figure 5** Rack Mounting



## 2.3 Connecting the Frame Ground

Follow the directions in this section for the IES-612-51 DC power version. This section is not applicable for the IES-612-51 AC power version.



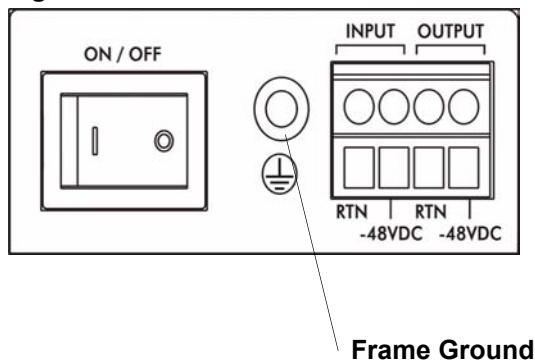
See [Chapter 58 on page 385](#) for the ground wire gauge.

- The IES-612-51 frame ground is on the lower left corner of the front panel.
- Connect the frame grounds to a building's protective earthing terminals using a green-and-yellow frame ground wire.



**Warning!** Connect the frame ground before you connect any other cables or wiring.

**Figure 6** IES-612-51 Frame Ground





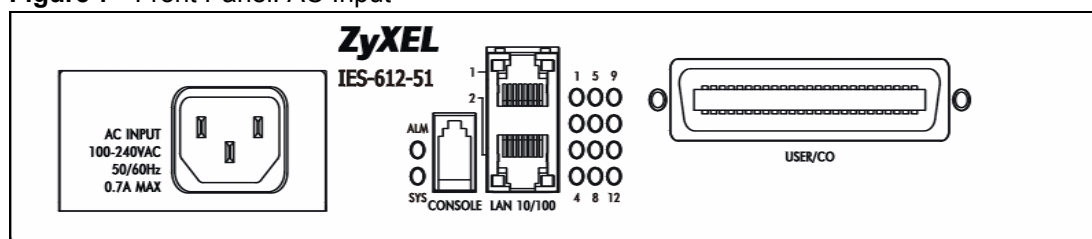
# Front Panel

This chapter describes the front panel and rear panel of the IES-612-51 and shows you how to make the hardware connections.

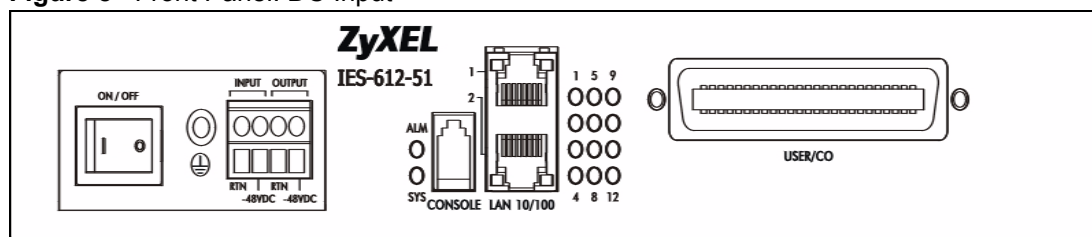
## 3.1 Front Panel

The figure below shows the front panels of the IES-612-51.

**Figure 7** Front Panel: AC Input



**Figure 8** Front Panel: DC Input



### 3.1.1 Front Panel Ports

The following table describes the port labels on the front panel.

**Table 1** Front Panel Ports

LABEL	DESCRIPTION
CONSOLE	Only connect to this port if you want to configure the IES-612-51 using the command line interface (CLI) via the console port.
LAN 10/100	Connect these ports to a computer, a hub, an Ethernet switch or router.
USER/CO	Connect the Telco-50 connector <b>USER</b> pins (14-25, 39-50) to subscribers respectively. Connect the Telco-50 connector <b>CO</b> pins (1-12, 26-37) to the telephone company for subscribers respectively.

## 3.2 LEDs

The following table describes the LEDs on the front panel.

**Table 2** LEDs

LED	COLOR	STATUS	DESCRIPTION
ALM	Red	On	The IES-612-51 is functioning abnormally.
		Off	The IES-612-51 is functioning normally.
SYS	Green	On	The IES-612-51's system is running.
		Blinking	The IES-612-51 is booting.
		Off	The IES-612-51's stem is not running.
ETHERNET (1~2)	Green	On	The IES-612-51 has a successful 10 Mbps connection on this port.
		Blinking	The IES-612-51 is sending/receiving data on this port.
	Orange	On	The IES-612-51 has a successful 100 Mbps connection on this port.
		Blinking	The IES-612-51 is sending/receiving data on this port.
ADSL (1~12)	Green	On	The IES-612-51 has a successful DSL connection.
		Blinking	The IES-612-51 is looking for a DSL connection.
		Off	The IES-612-51 does not have a DSL connection.

### 3.2.1 Console Port

For local management, you can use a computer with terminal emulation software configured to the following parameters:

- VT100 terminal emulation
- 9600 bps
- No parity, 8 data bits, 1 stop bit
- No flow control

Connect the male 9-pin end of the console cable to the console port of the IES-612-51.

Connect the female end to a serial port (COM1, COM2 or other COM port) of your computer.

#### 3.2.1.1 Default Ethernet Settings

The factory default negotiation settings for the Ethernet ports on the IES-612-51 are:

- Speed: Auto
- Duplex: Auto

### 3.2.2 LAN Port (Ethernet) Connection

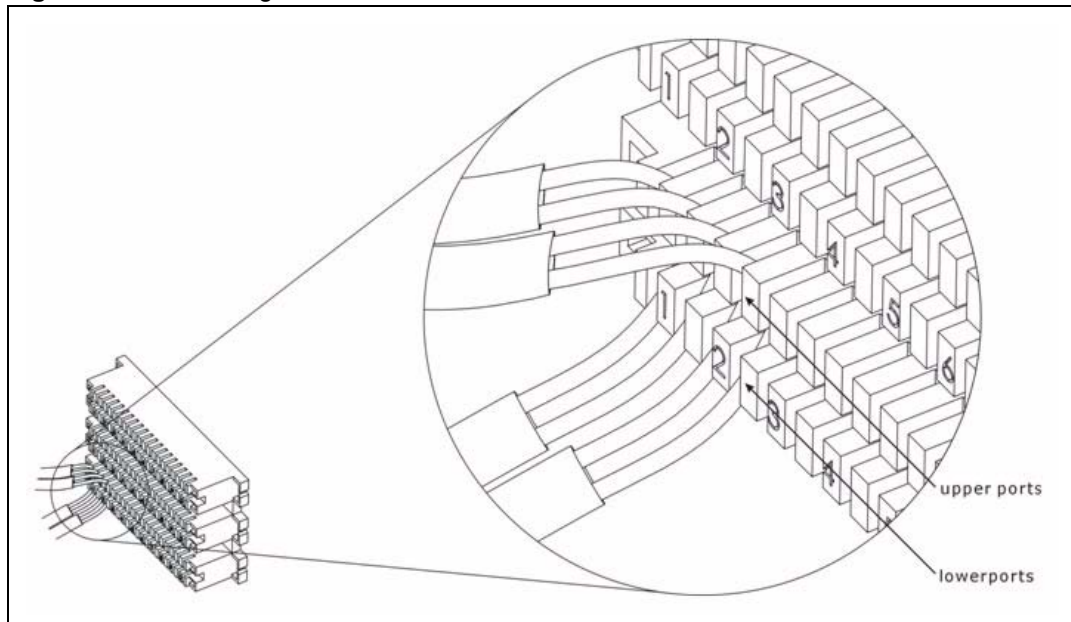
Connect the LAN port of your IES-612-51 to an Ethernet WAN switch using a straight-through Category 5 UTP (Unshielded Twisted Pair) cable with RJ-45 connectors.

You may connect multiple IES-612-51 units to the same Ethernet switch (up to the number of ports available on the Ethernet switch).

### 3.2.3 Notes About MDFs (Main Distribution Frames)

An MDF is usually installed between end-users' equipment and the telephone company (CO) in a basement or telephone room. The MDF is the point of termination for the outside telephone company lines coming into a building and the telephone lines in the building.

**Figure 9** MDF Wiring

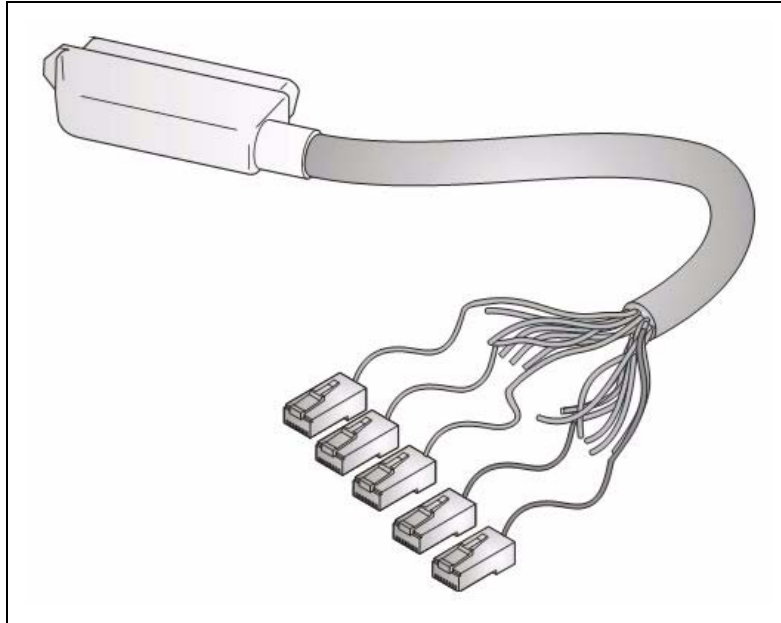


- Connect wiring from end-user equipment to the lower ports of an MDF using a telephone wire. Connect wiring from the telephone company to the upper ports of an MDF (see the previous figure).
- Some MDFs have surge protection circuitry built in between the two banks; thus, do not connect telephone wires from the telephone company directly to the IES-612-51.
- Use a punch-down tool to seat telephone lines between MDF blocks.

### 3.2.4 Telco-50 Cables

Telco-50 cables are used for data and voice applications with MDFs (Main Distribution Frame), patch panels and distribution boxes. They can also be used as extension cables. Telco-50 cables are made up of 25 twisted-pair copper wires.

Connect a Telco-50 connector to one end of the cable (see the hardware specifications appendix for pin assignments) and connect the other end directly to an MDF; alternatively attach RJ-11 connectors and connect directly to DSL modem(s).

**Figure 10** Telco-50 Cable with RJ-11 Connectors

### 3.2.5 Telco-50 Connections

The internal DSL splitters separate the voice signals from the DSL signals. They feed the DSL signals to the IES-612-51 and divert the voice signals to the **CO** lines of the Telco-50 connector.

Connect the **CO** lines of the Telco-50 connector to the PBX or PSTN/ISDN switch.

Connect the **USER** lines of the Telco-50 connector to the subscribers' telephone wiring. In most multi-tenant unit applications, the USER pins connect to the subscribers' telephone wiring via Main Distribution Frame (MDF).

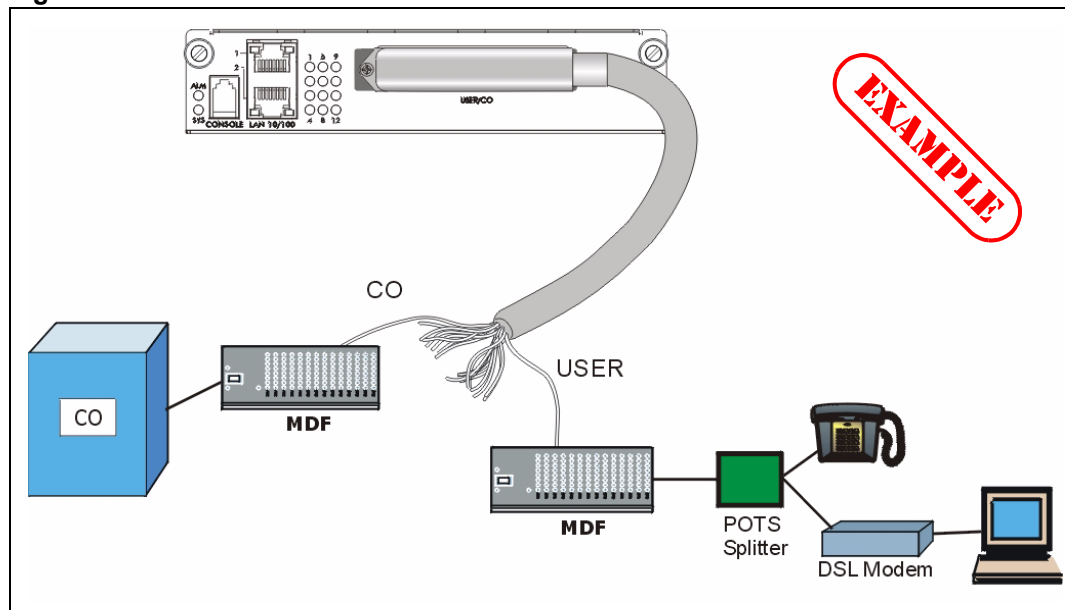
See the section on MDF scenarios and the pin assignments in the hardware specifications appendix for details on Telco-50 connections.

### 3.2.6 ADSL Connections

Connect the lines from the user equipment (ADSL modems) to the Telco-50 connector **USER** pins and the lines from the central office switch or PBX (Private Branch Exchange) to the Telco-50 connector **CO** pins. Make sure that the **USER** line and the **CO** lines are not shorted on the MDF (Main Distribution Frame).

The line from the user carries both the ADSL and the voice signals. For each line, the IES-612-51 has a built-in splitter that separates the high frequency ADSL signal from the voice band signal and feeds the voice band signal to the CO port.

The following figure gives an overview on a possible installation scenario for the IES-612-51. Data and voice signals can coexist on the same telephone wiring.

**Figure 11** Installation Overview

You can also attach RJ-11 connectors to the Telco-50 cable and connect directly to a DSL modem(s) or patch panel. This chapter discusses connections using MDFs.

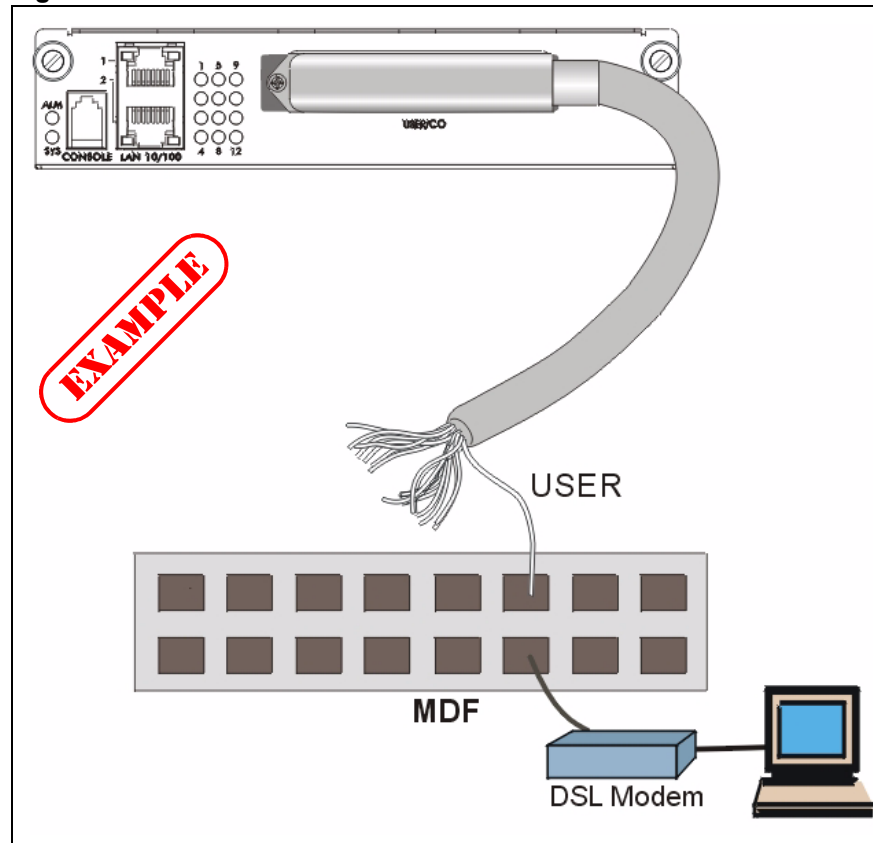
### 3.2.7 Typical MDF Scenarios

This section describes typical installation scenarios.

#### 3.2.7.1 Installation Scenario A

You want to install the IES-612-51 in an environment where there are no previously installed MDFs. There is no phone service and you want to install the IES-612-51 for data-access only. No connections from the **CO** lines are necessary.

You may connect using an MDF or attach RJ-11 connectors to the non-IES-612-51 end of the Telco-50 cable and then connect to DSL modems directly.

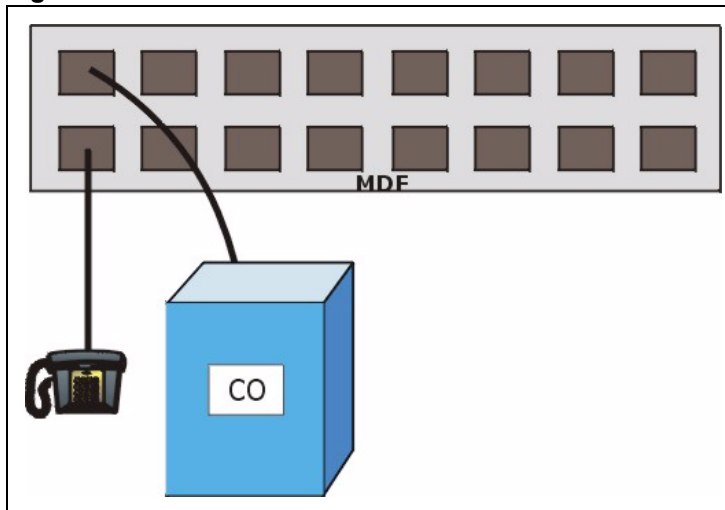
**Figure 12** Installation Scenario A

#### 3.2.7.1.1 Procedure To Connect To An MDF

- 1 Connect the Telco-50 connector end of the cable to the Telco-50 connector.
- 2 Connect the USER wiring on the other end of the Telco-50 cable to the upper ports of the MDF using a punch-down tool.
- 3 Connect the telephone wiring from each end-user's DSL modem to the lower ports of the MDF.

#### 3.2.7.2 Installation Scenario B

Phone service is available. There is one MDF from which end-users CO connections are made (see next figure).

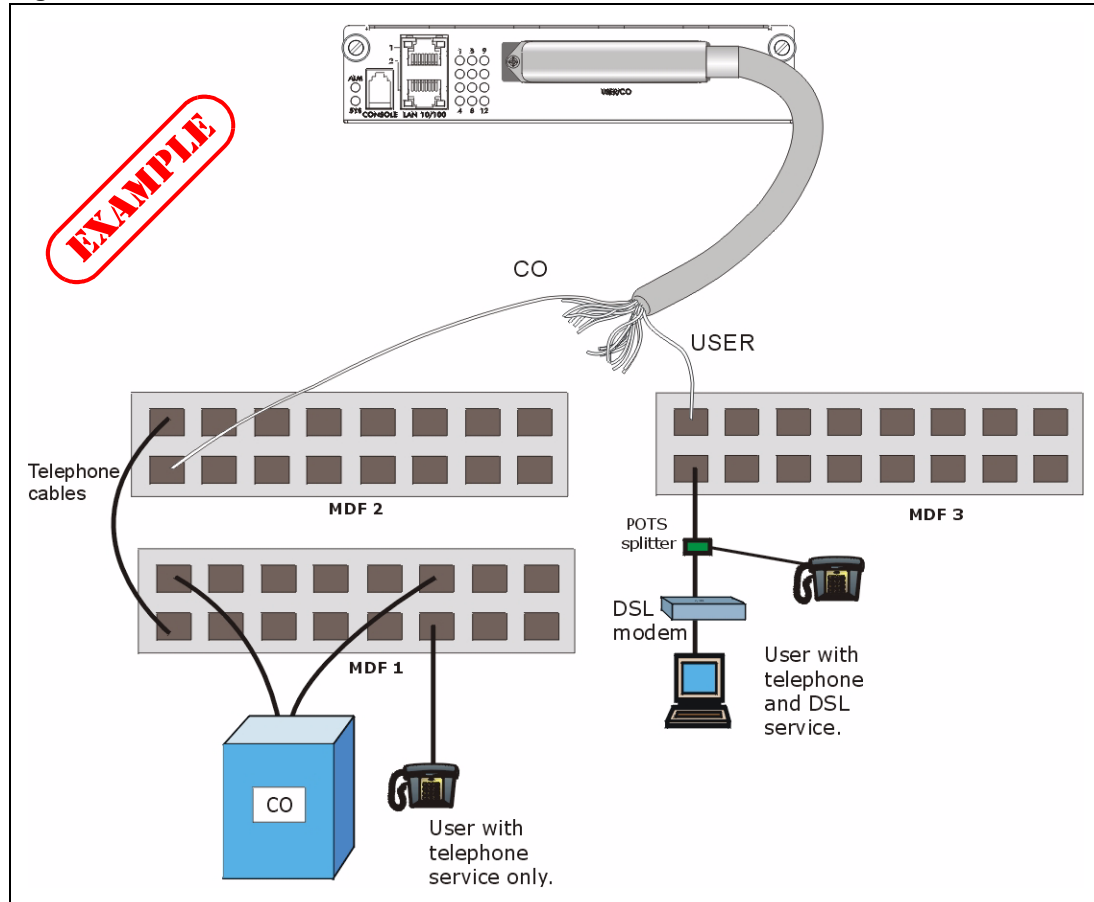
**Figure 13** One MDF for End-user and CO Connections

This installation scenario requires three MDFs. Please refer to the following figure for the connection schema.

- MDF 1 is the original MDF used for telephone connections only.
- MDF 2 is used for telephone connections only.
- MDF 3 is for ADSL service connections.



Change the wiring (in the following figure) from MDF 1 to MDF 3 for telephone subscribers who want ADSL service.

**Figure 14** Installation Scenario B

#### 3.2.7.2.1 Procedure To Connect To MDFs

- 1 Connect the Telco-50 connector end of the cable to the Telco-50 connector.
- 2 Connect the **USER** wiring on the other end of the Telco-50 cable to the upper ports of MDF 3 using a punch-down tool.
- 3 Connect the telephone wiring from the end-user's DSL modem(s) to the lower ports of MDF 3.
- 4 Connect the **CO** wiring of the Telco-50 cable to the lower ports of MDF 2 using a punch-down tool.
- 5 Connect the upper ports of MDF 2 to the lower ports of MDF 1 using telephone wires.
- 6 Connect the upper ports of MDF 1 to the telephone company.
- 7 Telephone subscribers only (non-DSL subscribers) retain connections to the lower ports of MDF 1.
- 8 Change the wiring from MDF 1 to MDF 3 for telephone subscribers who want DSL service.

#### 3.2.7.3 Installation Scenario C

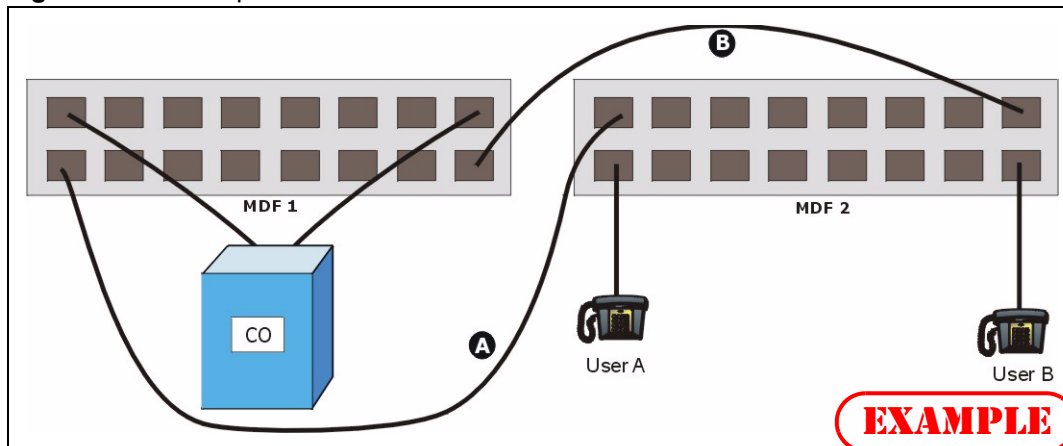
Phone service is also available but there are two MDFs; one for end-user telephone line connections and the other one for CO telephone wiring connections (see the following figure).





Users A and B have telephone (only) service.

**Figure 15** Two Separate MDFs for End-user and CO Connections

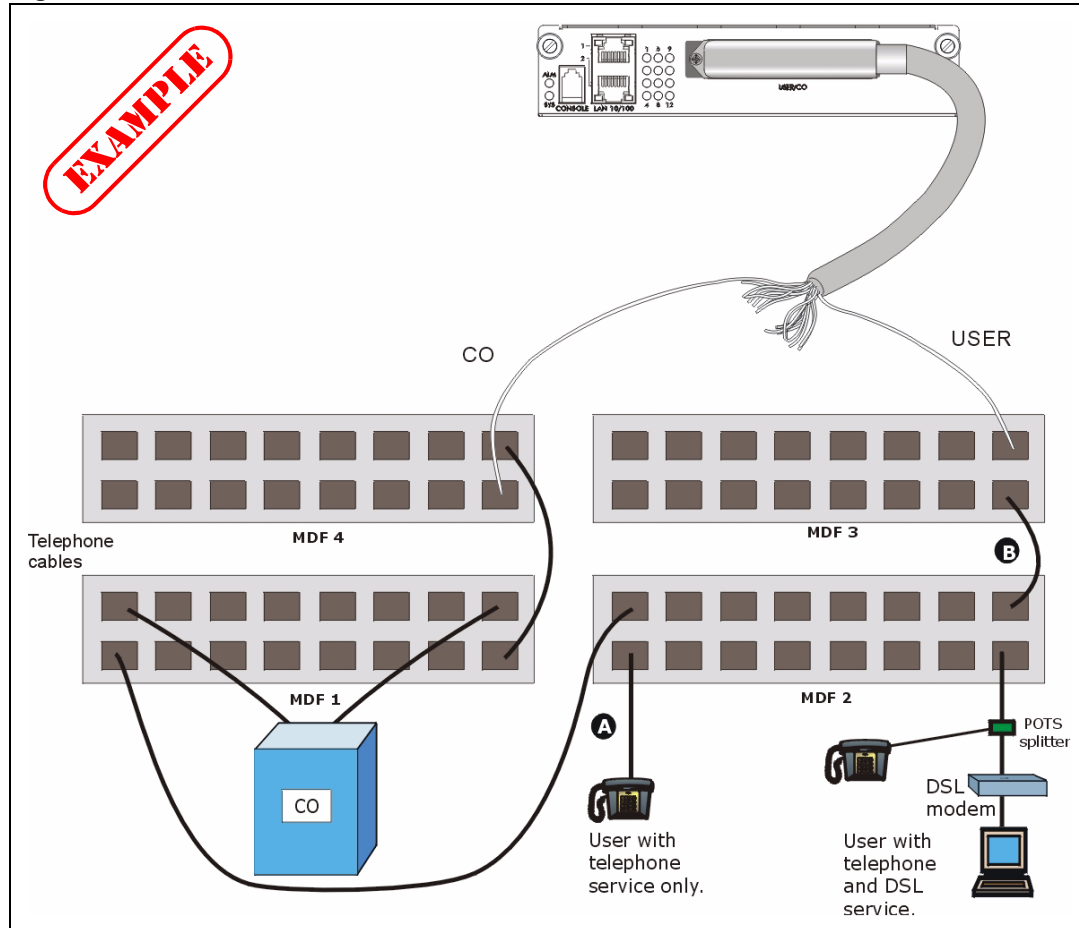


This installation scenario requires four MDFs. Please refer to the following figure for the DSL connection schema.

- MDFs 1 and 2 are the two original MDFs.
- MDFs 3 and 4 are two additional MDFs you need.



User A still has telephone service only. User B now has telephone and DSL service (see the following figure).

**Figure 16** Installation Scenario C

### 3.2.7.3.1 Procedure To Connect To MDFs

- 1 Connect the Telco-50 connector end of the cable to the Telco-50 connector.
- 2 Connect the **USER** wiring on the other end of the Telco-50 cable to the upper ports of MDF 3 using a punch-down tool.
- 3 Connect the lower ports of MDF 3 to the upper ports of MDF 2 for those users that want DSL service. (Users who want telephone service only, retain the original connection from the top port of MDF 2 to the bottom port of MDF 1.)
- 4 Connect the telephone wiring from the end-user's DSL equipment to the lower ports of MDF 2.
- 5 Connect the **CO** wiring of the Telco-50 cable to the lower ports of MDF 4 using a punch-down tool.
- 6 Connect the top ports of MDF 4 to the bottom ports of MDF 1 using telephone wires.
- 7 Connect the top ports of MDF 1 to the telephone company.

---

# PART II

## Basic Settings

---

[Introducing the Web Configurator \(61\)](#)

[Initial Configuration \(69\)](#)

[Home and Port Statistics Screens \(75\)](#)

[System Information \(87\)](#)

[General Setup \(91\)](#)

[User Account \(93\)](#)

[Switch Setup \(97\)](#)

[IP Setup \(103\)](#)

[ENET Port Setup \(105\)](#)

[xDSL Port Setup \(107\)](#)

[xDSL Profiles Setup \(125\)](#)

[xDSL Line Data \(137\)](#)



# Introducing the Web Configurator

This chapter tells how to access and navigate the web configurator.

## 4.1 Web Configurator Overview

The web configurator allows you to use a web browser to manage the IES-612-51.

## 4.2 Screen Privilege Levels

There is a high or low privilege level for each screen.

High privilege screens are only available to administrators with high privilege access. High privilege screens include things like creating administrator accounts, restarting the system, saving changes to the nonvolatile memory and resetting to factory defaults. Nonvolatile memory refers to the IES-612-51's storage that remains even if the IES-612-51's power is turned off. Administrators with high privilege access can use all screens including the lower privilege screens.

Administrators with the low privilege level are restricted to using only low privilege screens. Low privilege screens are read only.

## 4.3 Accessing the Web Configurator

Use Internet Explorer 6 and later versions with JavaScript enabled.

Use the following instructions to log on to the web configurator.

- 1 Launch your web browser, and enter the IP address of the IES-612-51 (default: **192.168.1.1** is the factory default) in the **Location** or **Address** field. Press **Enter**. The **Login** screen appears.

Figure 17 Login



**Enter Network Password**

Please type your user name and password.

Site: 192.168.1.1

Realm: AAM1212-51 at Thu Jan 01 18:18:52 1970

User Name:

Password:

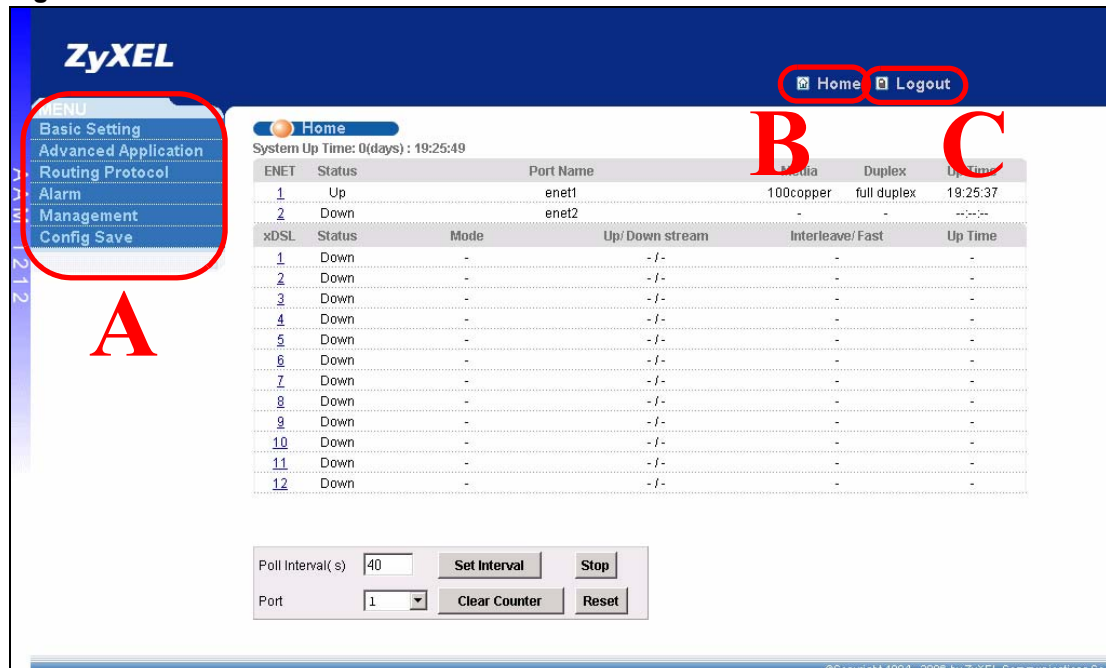
☐ Save this password in your password list

OK Cancel

- 2 Type **admin** in the **User Name** field and your password (default: **1234**) in the **Password** field. Click **OK**. The main screen appears.

This is the web configurator's main screen.

Figure 18 Home



**ZyXEL**

Home Logout

System Up Time: 0(days) : 19:25:49

ENET	Status	Port Name	Media	Duplex	Up Time
1	Up	enet1	100copper	full duplex	19:25:37
2	Down	enet2	-	-	--:--:--

xDSL	Status	Mode	Up/Down stream	Interleave/ Fast	Up Time
1	Down	-	- / -	-	-
2	Down	-	- / -	-	-
3	Down	-	- / -	-	-
4	Down	-	- / -	-	-
5	Down	-	- / -	-	-
6	Down	-	- / -	-	-
7	Down	-	- / -	-	-
8	Down	-	- / -	-	-
9	Down	-	- / -	-	-
10	Down	-	- / -	-	-
11	Down	-	- / -	-	-
12	Down	-	- / -	-	-

Poll Interval(s): 40

Port: 1

©Copyright 1994 - 2006 by ZyXEL Communications Co.

**A** - Click the menu items to open submenu links, and then click on a submenu link to open the screen in the main window. See [Section 4.4 on page 63](#) for more information.

**B** - Click this to open the **Home** screen. (This is the same screen that is displayed above.) See [Chapter 6 on page 75](#) for more information.

**C** - Click this to log out of the web configurator.

## 4.4 Navigation Panel

In the navigation panel, click a menu item to reveal a list of submenu links. Click a submenu link to go to the corresponding screen.

**Table 3** Navigation Panel Submenu Links

BASIC SETTING	ADVANCED APPLICATION	ROUTING PROTOCOL
<ul style="list-style-type: none"> <li>System Information</li> <li>General Setup</li> <li>User Account</li> <li>Switch Setup</li> <li>IP Setup</li> <li>ENET Port Setup</li> <li>xDSL Port Setup</li> <li>xDSL Profiles Setup</li> <li>xDSL Line Data</li> </ul>	<ul style="list-style-type: none"> <li>VLAN</li> <li>IGMP</li> <li>Static Multicast</li> <li>Multicast VLAN</li> <li>Filtering</li> <li>MAC Filter</li> <li>Spanning Tree Protocol</li> <li>Port Authentication</li> <li>Port Security</li> <li>DHCP Relay</li> <li>DHCP Snoop</li> <li>2684 Routed Mode</li> <li>PPPoA to PPPoE</li> <li>DSCP</li> <li>TLS PVC</li> <li>ACL</li> <li>Downstream Broadcast</li> <li>SysLog</li> <li>Access Control</li> </ul>	<ul style="list-style-type: none"> <li>Static Routing</li> </ul>
ALARM	MANAGEMENT	CONFIG SAVE
<ul style="list-style-type: none"> <li>Alarm Status</li> <li>Alarm Event Setup</li> <li>Alarm Port Setup</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance</li> <li>Diagnostic</li> <li>MAC Table</li> <li>ARP Table</li> </ul>	<ul style="list-style-type: none"> <li>Config Save</li> </ul>

The following table briefly describes the functions of the screens that you open by clicking the navigation panel's sub-links.

**Table 4** Web Configurator Screens

LABEL	DESCRIPTION
Basic Setting	
System Information	Use this screen to display general system and hardware monitoring information.
General Setup	Use this screen to configure general identification information about the device and the time and date settings.
User Account	Use this screen to configure system administrator accounts.
Switch Setup	Use this screen to set up system-wide parameters such as MAC address learning and priority queues.

**Table 4** Web Configurator Screens (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
IP Setup	Use this screen to configure the system and management IP addresses and subnet masks.
ENET Port Setup	Use this screen to configure settings for the Ethernet ports.
xDSL Port Setup	Use these screens for configuring settings for individual DSL ports.
xDSL Profiles Setup	Use these screens for configuring profiles for the DSL ports.
xDSL Line Data	Use these screens for viewing DSL line operating values, bit allocation and performance counters.
Advanced Application	
VLAN	Use these screens for viewing and configuring the VLAN settings.
IGMP	Use these screens to view IGMP status information and configure IGMP settings and IGMP filters. You can also use these screens to set up bandwidth requirements by multicast group or port and to set up limits on the number of multicast groups to which a port can subscribe.
Static Multicast	Use this screen to configure static multicast entries.
Multicast VLAN	Use these screens to set up multicast VLANs that can be shared among different subscriber VLANs on the network.
Filtering	Use this screen to configure packet filtering.
MAC Filter	Use this screen to configure MAC filtering for each port.
Spanning Tree Protocol	Use these screens to display Rapid Spanning Tree Protocol (RSTP) information and configure RSTP settings.
Port Authentication	Use these screens to configure RADIUS and IEEE 802.1x security settings.
Port Security	Use this screen to limit the number of MAC address that can be learned on a port.
DHCP Relay	Use this screen to configure the DHCP relay settings.
DHCP Snoop	Use these screens to drop traffic from IP addresses not assigned by the DHCP server and to look at a summary of the DHCP packets on each port.
2684 Routed Mode	Use this screen to configure the IES-612-51 to handle 2684 routed mode traffic.
PPPoA to PPPoE	Use this screen to enable PPPoA-to-PPPoE conversions on each port.
DSCP	Use this screen to set up DSCP on each port and to convert DSCP values to IEEE 802.1p values.
TLS PVC	Use this screen to set up Transparent LAN Service (VLAN stacking, Q-in-Q) on each port.
ACL	Use this screen to set up Access Control Logic profiles and to assign them to each PVC.
Downstream Broadcast	Use this screen to block downstream broadcast packets from being sent to specified VLANs on specified ports.
SysLog	Use this screen to configure the syslog settings.
Access Control	Use this screen to configure service access control and configure SNMP and remote management.
Routing Protocol	
Static Routing	Use this screen to configure static routes. A static route defines how the IES-612-51 should forward traffic by configuring the TCP/IP parameters manually.
Alarm	



**Table 4** Web Configurator Screens (continued)

LABEL	DESCRIPTION
Alarm Status	Use these screens to view the alarms that are currently in the system.
Alarm Event Setup	Use these screens to view and set the severity levels of the alarms and where the system is to send them.
Alarm Port Setup	Use this screen to set the alarm severity threshold for recording alarms on an individual port(s).
Management	
Maintenance	Use this screen to perform firmware and configuration file maintenance as well as restart the system.
Diagnostic	Use this screen to view system logs and test port(s).
MAC Table	Use this screen to view the MAC addresses of devices attached to what ports.
ARP Table	Use this screen to view the MAC address to IP address resolution table.
Config Save	
Config Save	Use this screen to save the device's configuration into the nonvolatile memory (the IES-612-51's storage that remains even if the IES-612-51's power is turned off).

## 4.5 Changing Your Password

After you log in for the first time, it is recommended you change the default administrator password. Click **Basic Setting** and then **User Account** to display the **User Account** screen.

**Figure 19** User Account

**User Account** [Authentication](#)

Enable ☒

Name

Password

Retype Password to confirm

Privilege

**Add** **Cancel**

Index	Enable	Name	Privilege	Select
<a href="#">1</a>	V	admin	high	<input type="checkbox"/>

**Delete** **Cancel**

Click the index number **1** to edit the default administrator account settings.

**Figure 20** User Account

Index	Enable	Name	Privilege	Select
1	<input checked="" type="checkbox"/>	admin	high	<input type="checkbox"/>

Enter the new password in the **Password** and **Retype Password** to confirm fields, and click **Modify**. Do not forget to click **Config Save** before you exit the web configurator. See [Section 4.6 on page 66](#).

## 4.6 Saving Your Configuration

Click **Apply** in a configuration screen when you are done modifying the settings in that screen to save your changes back to the run-time memory. Settings in the run-time memory are lost when the IES-612-51's power is turned off.

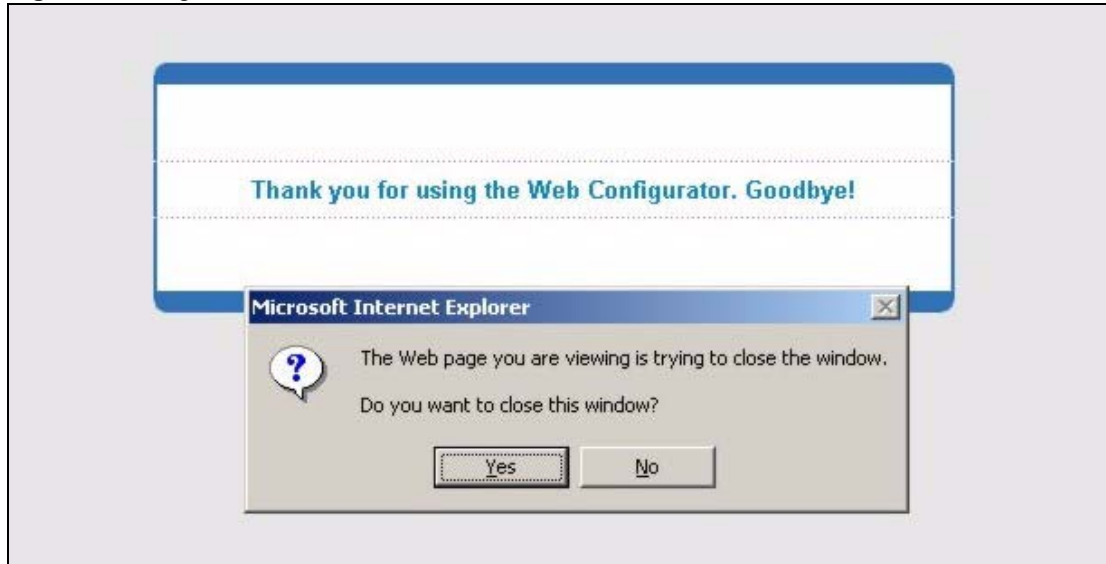
Click **Config Save** in the navigation panel to save your configuration to nonvolatile memory. Nonvolatile memory refers to the IES-612-51's storage that remains even if the IES-612-51's power is turned off.



Use **Config Save** when you are done with a configuration session.

## 4.7 Logging Out of the Web Configurator

Click **Logout** in any screen to exit the web configurator. You have to log in with your password again after you log out. This is recommended after you finish a management session both for security reasons and so you do not lock out other device administrators.

**Figure 21** Logout



# Initial Configuration

This chapter describes initial configuration for the IES-612-51. See [Chapter 58 on page 385](#) for various default settings of the IES-612-51.

## 5.1 Initial Configuration Overview

This chapter shows what you first need to do to provide service to DSL subscribers.

## 5.2 Initial Configuration

This chapter uses the web configurator for initial configuration. See the CLI chapters for information on the commands. Use Internet Explorer 6 and later versions with JavaScript enabled.

- 1 Log in to the web configurator. See [Section 4.3 on page 61](#) for instructions.
- 2 In the navigation panel, click **Basic Setting**, **IP Setup**. The **IP Setup** screen appears.

**Figure 22** IP Setup

IP Setup

IP 192.168.1.1

IP mask 255.255.255.0

Apply IP setting Cancel

Default Gateway 192.168.1.254

Apply Gateway setting Cancel

- 3 Use this screen to change the IP address, subnet mask, and default gateway IP address for your network. Apply the settings.



If you change the IP address of the IES-612-51, after you click **Apply IP setting**, you have to use the new IP address to log into the web configurator again.

- 4 If your subscribers use VPI 0 and VCI 33 (the default for all of the DSL ports), go to step 13. Otherwise, use the following steps to change the VPI and VCI settings for all of the DSL ports.

First, you will delete the default virtual channel from all of the DSL ports. (You cannot edit it). Then, you will configure a new virtual channel for a port and copy it to the other DSL ports.

Adding another virtual channel without deleting the default virtual channel is not recommended since you cannot set the new channel to be the port's super channel. The super channel can forward frames belonging to multiple VLAN groups (that are not assigned to other channels). A channel that is not the super channel can only forward frames with a single VLAN ID (that is configured on that channel). In this case, the IES-612-51 drops any frames received from the subscriber that are tagged with another VLAN ID.

- 5 In the navigation panel, click **Basic Setting**, **xDSL Port Setup**. The **xDSL Port Setup** screen appears.

**Figure 23** xDSL Port Setup

Port	Active	Customer Info	Customer Tel	Profile	Mode	Channels
1	enabled			DEFVAL	auto	1
2	enabled			DEFVAL	auto	1
3	enabled			DEFVAL	auto	1
4	enabled			DEFVAL	auto	1
5	enabled			DEFVAL	auto	1

- 6 Click **VC Setup**. The following screen appears.

Figure 24 VC Setup

VC Setup

xDSL Port SetupPPVC Setup

Port1

Super Channel☐

VPI0

VCI0

DS VC ProfileDEFVAL

US VC Profile-

PVID1 (1-4094)

Priority0

AddCancel

Show PortALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	0/33	DEFVAL/	*	*	<input type="radio"/>
2	2	0/33	DEFVAL/	*	*	<input type="radio"/>
3	3	0/33	DEFVAL/	*	*	<input type="radio"/>
4	4	0/33	DEFVAL/	*	*	<input type="radio"/>
5	5	0/33	DEFVAL/	*	*	<input type="radio"/>

Index -1 selectedDeleteNo Channel copiedCopyPaste

- 7 Select any virtual channel's **Select** radio button, and click **Delete**. The following screen appears.

Figure 25 VC Setup, Delete

Microsoft Internet Explorer

?

Do you want to delete this channel in other ports too?

OKCancel

- 8 Click **OK**. The following screen appears.

Figure 26 Select Ports

0123456789

1-9☐☐☐☐☐☐☐☐☐☐

10-12☐☐☐

ENET1☐

ENET2☐

selectAllNone

ApplyCancel

- 9 Click **All**, and then click **Apply**. The **VC Setup** screen is updated.

**Figure 27** VC Setup

The screenshot shows the 'VC Setup' configuration page. At the top, there are tabs for 'VC Setup' (active), 'xDSL Port Setup', and 'PPVC Setup'. Below the tabs, there are several input fields: 'Port' (dropdown set to 1), 'VPI' (text box with 0), 'VCI' (text box with 0), 'DS VC Profile' (dropdown set to DEFVAL), 'US VC Profile' (dropdown set to -), 'PVID' (text box with 1, range 1-4094), 'Priority' (dropdown set to 0), and 'Super Channel' (checkbox). Below these fields are 'Add' and 'Cancel' buttons. At the bottom, there is a 'Show Port' dropdown set to 'ALL'. Below that is a table with columns: Index Port, VPI/VCI, DS / US VC Profile, PVID, Priority, and Select. The table is currently empty. At the bottom of the page, there are buttons for 'Delete', 'Copy', and 'Paste', along with the text 'Index -1 selected' and 'No Channel copied'.

- 10 Select **Super Channel** to allow the channel to forward frames belonging to multiple VLAN groups (that are not assigned to other channels). Then, enter the VPI and VCI that you use. Leave the other default settings, and click **Add**. The **VC Setup** screen is updated.

**Figure 28** VC Setup

The screenshot shows the 'VC Setup' configuration page after adding a new channel. The 'Super Channel' checkbox is now checked. The 'VPI' text box now contains '10' and the 'VCI' text box now contains '43'. The 'Add' button is highlighted. The 'Show Port' dropdown is still set to 'ALL'. The table below now contains one entry:
 

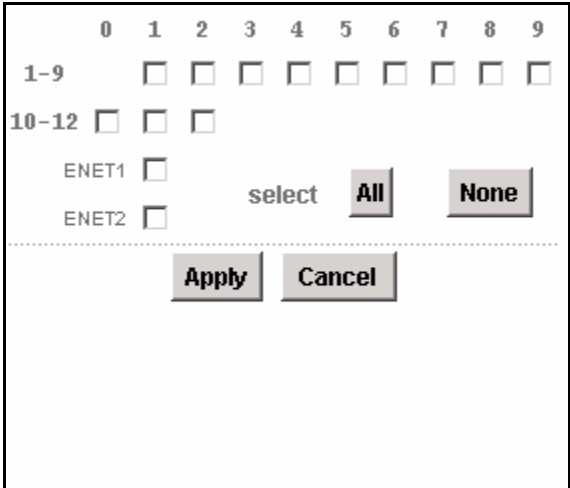
Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	10/43	DEFVAL/-	1	0	<input type="radio"/>

 At the bottom of the page, there are buttons for 'Delete', 'Copy', and 'Paste', along with the text 'Index -1 selected' and 'No Channel copied'.

- 11 Select the new channel's **Select** radio button. Click **Copy**, and then click **Paste**. The following screen appears. The following screen appears.



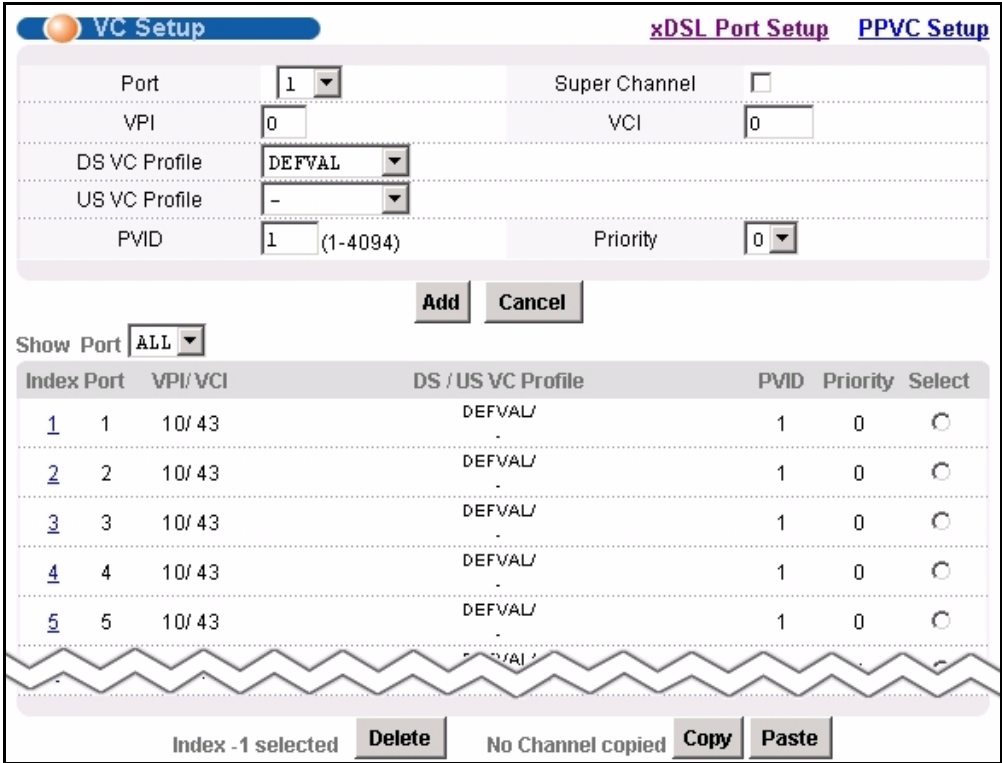
**Figure 29** Select Ports



The 'Select Ports' dialog box shows a grid of checkboxes for ports 0 through 9. Ports 1-9 are in one row, and ports 10-12 are in another. Below the grid are checkboxes for 'ENET1' and 'ENET2'. To the right of these checkboxes are 'select', 'All', and 'None' buttons. At the bottom are 'Apply' and 'Cancel' buttons.

**12** Click **All**, and then click **Apply**. The **VC Setup** screen is updated.

**Figure 30** VC Setup



The 'VC Setup' screen has tabs for 'VC Setup', 'xDSL Port Setup', and 'PPVC Setup'. The 'VC Setup' tab is active. It contains fields for 'Port' (dropdown), 'VPI' (text), 'DS VC Profile' (dropdown), 'US VC Profile' (dropdown), 'PVID' (text), 'Super Channel' (checkbox), 'VCI' (text), and 'Priority' (dropdown). Below these fields are 'Add' and 'Cancel' buttons. A 'Show Port' dropdown is set to 'ALL'. Below this is a table with columns: Index, Port, VPI/VCI, DS / US VC Profile, PVID, Priority, and Select. The table contains 5 rows of data. At the bottom are buttons for 'Delete', 'Copy', and 'Paste'.

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	10/ 43	DEFVAL/	1	0	<input type="radio"/>
2	2	10/ 43	DEFVAL/	1	0	<input type="radio"/>
3	3	10/ 43	DEFVAL/	1	0	<input type="radio"/>
4	4	10/ 43	DEFVAL/	1	0	<input type="radio"/>
5	5	10/ 43	DEFVAL/	1	0	<input type="radio"/>

**13** Click **Config Save**, **Config Save**. The **Config Save** screen appears.

**Figure 31** Config Save



The 'Config Save' screen has a title bar with 'Config Save' and a warning message: 'According to data entries, Saving process may take 10 seconds to several minutes.' Below the warning is a 'Save' button.

**14** Click **Save**. The following screen should appear.

**Figure 32** Config Save, Save Successful



You can now use the device (with the other settings set to the defaults) to provide service to DSL subscribers. See [Section 58.4 on page 391](#) for information on other default settings.

# Home and Port Statistics Screens

This chapter describes the **Home** (status), **Port Statistics**, and **RMON** screens.

## 6.1 Home Screen

The **Home** screen of the web configurator displays a port statistical summary with links to each port showing statistical details.

To open this screen, click **Home** in any web configurator screen.

**Figure 33** Home

**Home**  
System Up Time: 0(days) : 19:30:31

ENET	Status	Port Name	Media	Duplex	Up Time
<a href="#">1</a>	Up	enet1	100copper	full duplex	19:30:19
<a href="#">2</a>	Down	enet2	-	-	--:--

xDSL	Status	Mode	Up/ Down stream	Interleave/ Fast	Up Time
<a href="#">1</a>	Down	-	- / -	-	-
<a href="#">2</a>	Down	-	- / -	-	-
<a href="#">3</a>	Down	-	- / -	-	-
<a href="#">4</a>	Down	-	- / -	-	-
<a href="#">5</a>	Down	-	- / -	-	-

Poll Interval( s)

Port

The following table describes the labels in this screen.

**Table 5** Home

LABEL	DESCRIPTION
System up Time	This field shows how long the system has been running since the last time it was started.
	The following fields are related to the Ethernet ports.
ENET	This field displays the number of the Ethernet port. Click a port number to display that port's statistics screen. The <a href="#">Ethernet Port Statistics Screen</a> appears. See <a href="#">Section 6.1.1 on page 76</a> .
Status	This field displays whether the Ethernet port is connected ( <b>Up</b> ) or not ( <b>Down</b> ).
Port Name	This field displays the name of the Ethernet port.

**Table 5** Home (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Media	This field displays the type of media that this Ethernet port is using for a connection. "-" displays when the port is disabled or not connected.
Duplex	This field displays whether the port is using half or full-duplex communication. "-" displays when the port is disabled or not connected.
Up Time	This field shows the total amount of time in hours, minutes and seconds the port's connection has been up. "--:--:--" displays when the port is disabled or not connected.
	The following fields are related to the xDSL ports.
xDSL	This identifies the xDSL port. Click a port number to display that port's statistics screen. The <a href="#">DSL Port Statistics Screen</a> appears. See <a href="#">Section 6.1.2 on page 79</a> .
Status	This field shows whether the port is connected ( <b>Up</b> ) or not ( <b>Down</b> ).
Mode	This field shows which ADSL operational mode the port is set to use. "-" displays when the port is not connected.
Up/Down stream	This field shows the number of kilobits per second that a port is set to transmit and receive.
Interleave/Fast	This field shows the port's ADSL latency mode (fast or interleave).
Up Time	This field shows the total amount of time in hours, minutes and seconds the port's connection has been up. "-" displays when the port is not connected.
	The following fields and buttons apply to the whole screen.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt system statistic polling.
Port Clear Counter	Select a port from the <b>Port</b> drop-down list box and then click <b>Clear Counter</b> to erase the recorded statistical information for that port.
Reset	Click this to set the <b>Poll Interval(s)</b> and <b>Port</b> fields to their default values and to refresh the screen.

### 6.1.1 Ethernet Port Statistics Screen

Use this screen to display statistics about an Ethernet port. To open this screen, click an Ethernet port's number in the **Home** screen.

**Figure 34** Port Statistics (Ethernet)

**Port Statistics** [RMON](#) [Return](#)

Port: **ENET1**

Port Name	enet1		
Rx bytes	29544799	Rx packets	348191
Rx error fcs	0	Rx multicast	18963
Rx broadcast	327387	Rx mac pause	0
Rx fragments	0	Rx error overrun	0
Rx error mru	6	Rx dropped	0
Rx jabber	0	Rx error alignment	0
Rx oversize	0	Rx undersize	0
Rx discard	17948		
Tx bytes	1733468	Tx packets	2067
Tx multicast	0	Tx broadcast	0
Tx mac_pause	0	Tx fragments	0
Tx frames	2067	Tx error underrun	0
Tx undersize	0	Tx jabber	0
Tx oversize	0		
packet(<=64)	265945	packet(65-127)	46948
packet(128-255)	30992	packet(256-511)	4554
packet(512-1023)	817	packet(1024-1518)	1002
packet(1522)	0		
packet(total)	350258	broadcast(total)	327387
multicast(total)	18963	octet(total)	31278267

Poll Interval( s)

Port

The following table describes the labels in this screen.

**Table 6** Port Statistics (Ethernet)

LABEL	DESCRIPTION
RMON	Click this to open the <b>RMON Statistics</b> screen.
Return	Click this to go back to the <b>Home</b> screen.
Port	Use this drop-down list box to select a port for which you wish to view statistics. This field identifies the port described in this screen.
Port Name	This field displays the name that you have configured for the port.
Rx bytes	This field shows the number of octets of Ethernet frames received that are from 0 to 1518 octets in size, counting the ones in bad packets, not counting framing bits but counting FCS (Frame Check Sequence) octets. An octet is an 8-bit binary digit (byte).
Rx packets	This field shows the number of packets received on this port (including multicast, unicast, broadcast and bad packets).
Rx error fcs	This field shows the number of frames received with an integral length of 64 to 1518 octets and containing a Frame Check Sequence error.
Rx multicast	This field shows the number of good multicast frames received of 64 to 1518 octets in length (for non VLAN) or 1522 octets (for VLAN), not including Broadcast frames. Frames with range or length errors are also not taken into account.
Rx broadcast	This field shows the number of good broadcast frames received of 64 to 1518 octets in length (for non VLAN) or 1522 octets (for VLAN), not including multicast frames. Frames with range or length errors are also not taken into account.

**Table 6** Port Statistics (Ethernet) (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Rx mac pause	This field shows the number of valid IEEE 802.3x Pause frames received on this port.
Rx fragments	This field shows the number of frames received that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
Rx error overrun	This field shows how many times an Ethernet transmitter overrun occurred.
Rx error mru	This field shows the number of received frames that were dropped due to exceeding the Maximum Receive Unit frame size.
Rx dropped	This field shows the number of received frames that were received into the IES-612-51, but later dropped because of a lack of system resources.
Rx jabber	This field shows the number of frames received that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
Rx error alignment	This field shows the number of frames received that were 64 to 1518 (non VLAN) or 1522 (VLAN) octets long but contained an invalid FCS and a non-integral number of octets.
Rx oversize	This field shows the number of frames received that were bigger than 1518 (non VLAN) or 1522 (VLAN) octets and contained a valid FCS.
Rx undersize	This field shows the number of frames received that were less than 64 octets long and contained a valid FCS.
Rx discard	This field shows the number of frames dropped based on packet filtering.
Tx bytes	This field shows the number of bytes that have been transmitted on this port. This includes collisions but not jam signal or preamble/SFD (Start of Frame Delimiter) bytes.
Tx packets	This field shows the number of packets transmitted on this port.
Tx multicast	This field shows the number of good multicast frames transmitted on this port (not including broadcast frames).
Tx broadcast	This field shows the number of broadcast frames transmitted on this port (not including multicast frames).
Tx mac_pause	This field shows the number of valid IEEE 802.3x Pause frames transmitted on this port.
Tx fragments	This field shows the number of transmitted frames that were less than 64 octets long, and with an incorrect FCS value.
Tx frames	This field shows the number of complete good frames transmitted on this port.
Tx error underrun	This field shows the number of outgoing frames that were less than 64 octets long.
Tx undersize	This field shows the number of frames transmitted that were less than 64 octets long and contained a valid FCS.
Tx jabber	This field shows the number of frames transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an incorrect FCS value.
Tx oversize	This field shows the number of frames transmitted that were bigger than 1518 octets (non VLAN) or 1522 (VLAN) and contained a valid FCS.
packet(<=64)	This field shows the number of frames received and transmitted (including bad frames) that were 64 octets or less in length (this includes FCS octets but excludes framing bits).
packet(65-127)	This field shows the number of frames received and transmitted (including bad frames) that were 65 to 127 octets in length (this includes FCS octets but excludes framing bits).

**Table 6** Port Statistics (Ethernet) (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
packet(128-255)	This field shows the number of frames received and transmitted (including bad frames) that were 128 to 255 octets in length (this includes FCS octets but excludes framing bits).
packet(256-511)	This field shows the number of frames received and transmitted (including bad frames) that were 256 to 511 octets in length (this includes FCS octets but excludes framing bits).
packet(512-1023)	This field shows the number of frames received and transmitted (including bad frames) that were 512 to 1023 octets in length (this includes FCS octets but excludes framing bits).
packet(1024-1518)	This field shows the number of frames received and transmitted (including bad frames) that were 1024 to 1518 octets in length (this includes FCS octets but excludes framing bits).
packet(1522)	This field shows the number of frames received and transmitted (including bad frames) that were 1519 to 1522 octets in length (this includes FCS octets but excludes framing bits).
packet(total)	This field shows the total number of received and transmitted packets.
broadcast(total)	This field shows the total number of received and transmitted broadcast frames.
multicast(total)	This field shows the total number of received and transmitted multicast frames.
octet(total)	This field shows the total number of received and transmitted octets (unicast, multicast and broadcast).
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt system statistic polling.
Port Clear Counter	Select a port from the <b>Port</b> drop-down list box and then click <b>Clear Counter</b> to erase the recorded statistical information for that port.
Reset	Click this to set the <b>Poll Interval(s)</b> and <b>Port</b> fields to their default values and to refresh the screen.

### 6.1.2 DSL Port Statistics Screen

Use this screen to display statistics about a DSL port. To open this screen, click a DSL port's number in the **Home** screen.

**Figure 35** Port Statistics (DSL)

**Port Statistics** [RMON](#) [Return](#)

xDSL Port: 1

Port Name	
Tx packets	327628
Rx packets	0
Tx broadcast packets	327449
Rx broadcast packets	0
Tx discard packets	0
Rx discard packets	0
Errors	0
Tx rate	212
Rx rate	0
Tx bytes	40182162
Rx bytes	0

VPI/VCI	
0/33	- - - - -
Tx Packets	327628
Rx Packets	0
Tx rate	212
Rx rate	0
Tx cells	758154
Rx cells	0
Errors	0

Poll Interval(s): 40 [Set Interval](#) [Stop](#)

Port: 1 [Clear Counter](#) [Reset](#)

The following table describes the labels in this screen.

**Table 7** Port Statistics (DSL)

LABEL	DESCRIPTION
RMON	Click this to open the <b>RMON Statistics</b> screen.
Return	Click this to go back to the <b>Home</b> screen.
xDSL Port	Use this drop-down list box to select a port for which you wish to view statistics. This field identifies the port described in this screen.
Port Name	This field displays the name that you have configured for the port. If you have not configured a name, it is blank.
Tx packets	This field shows the number of packets transmitted on this port.
Rx packets	This field shows the number of packets received on this port.
Tx broadcast packets	This field shows the number of broadcast packets transmitted on this port.
Rx broadcast packets	This field shows the number of broadcast packets received on this port.
Tx discard packets	This field shows the number of outgoing packets that were dropped on this port. The "Tx discard packets" counter always displays "0" because the IES-612-51 does not discard packets that it sends.



**Table 7** Port Statistics (DSL) (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Rx discard packets	This field shows the number of received packets that were dropped on this port. Some of the possible reasons for the discarding of received (rx) packets are: <ul style="list-style-type: none"> <li>• The packet filter is enabled and the packets matched a packet filter.</li> <li>• The MAC filter is enabled and the IES-612-51 dropped the packets according to the MAC filter's configuration.</li> <li>• The packets contained frames with an invalid VLAN ID.</li> </ul>
Errors	This field shows the number of AAL5 frames received with CRC errors.
Tx rate	This field shows the number of kilobytes per second transmitted on this port.
Rx rate	This field shows the number of kilobytes per second received on this port.
Tx bytes	This field shows the number of bytes that have been transmitted on this port.
Rx bytes	This field shows the number of bytes that have been received on this port.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) of channels on this port.
Tx Packets	This field shows the number of packets transmitted on each channel.
Rx Packets	This field shows the number of packets received on each channel.
Tx rate	This field shows the number of bytes per second transmitted on each channel.
Rx rate	This field shows the number of bytes per second received on each channel.
Tx cells	This field shows the number of ATM cells transmitted on each channel.
Rx cells	This field shows the number of ATM cells received on each channel.
Errors	This field shows the number of error packets on each channel.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt system statistic polling.
Port Clear Counter	Select a port from the <b>Port</b> drop-down list box and then click <b>Clear Counter</b> to erase the recorded statistical information for that port.
Reset	Click this to set the <b>Poll Interval(s)</b> and <b>Port</b> fields to their default values and to refresh the screen.

### 6.1.3 RMON Statistics Screen

Use this screen to display RMON statistics about a port. To open this screen, click **RMON** in the **DSL Port Statistics** screen or **Ethernet Port Statistics** screen.

**Figure 36** Port Statistics (RMON)

	Enet1	Enet2
etherStatsDropEvents	0	0
etherStatsOctets	7529467	1461837
etherStatsPkts	26003	14852
etherStatsBroadcastPkts	14740	14605
etherStatsMulticastPkts	1106	100
etherStatsCRCAlignErrors	0	0
etherStatsUndersizePkts	0	0
etherStatsOversizePkts	0	0
etherStatsFragments	0	0
etherStatsJabbers	0	0
etherStatsCollisions	0	0
etherStats64Octets	14193	8575
etherStats65to127Octets	3896	3542
etherStats128to255Octets	2939	2507
etherStats256to511Octets	1290	223
etherStats512to1023Octets	391	5
etherStats1024to1518Octets	3294	0

Poll Interval( s)

Port

The following table describes the labels in this screen.

**Table 8** Port Statistics (RMON)

LABEL	DESCRIPTION
Port Statistics	Click this to go back to the previous screen.
Enet1	Click this to look at the RMON history for this port.
Enet2	Click this to look at the RMON history for this port.
EtherStatsDropEvents	This field displays the total number of packets that were dropped on this port.
EtherStatsOctets	This field displays the total number of octets received/transmitted on this port.
EtherStatsPkts	This field displays the total number of good packets received/transmitted on this port.
EtherStatsBroadcastPkts	This field displays the total number of broadcast packets received/transmitted on this port.
EtherStatsMulticastPkts	This field displays the total number of multicast packets received/transmitted on this port.
EtherStatsCRCAlignErrors	This field displays the total number of CRC (Cyclical Redundancy Check) alignment errors on this port.
EtherStatsUndersizePkts	This field displays the total number of packets that were too small received/transmitted on this port.

**Table 8** Port Statistics (RMON) (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
EtherStatsOversizePkts	This field displays the total number of packets that were too big received/transmitted on this port.
EtherStatsFragments	This is the number of frames received/transmitted that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
EtherStatsJabbers	This is the number of frames received/transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
EtherStatsCollisions	This is the number of frames for which transmission failed due to excessive collisions. Excessive collision is defined as the number of maximum collisions before the retransmission count is reset.
EtherStats64Octets	This is the number of frames received/transmitted (including bad frames) that were 64 octets or less in length (this includes FCS octets but excludes framing bits).
EtherStats65to127Octets	This is the number of frames received/transmitted (including bad frames) that were 65 to 127 octets in length (this includes FCS octets but excludes framing bits).
EtherStats128to255Octets	This is the number of frames received and transmitted (including bad frames) that were 128 to 255 octets in length (this includes FCS octets but excludes framing bits).
EtherStats256to511Octets	This is the number of frames received/transmitted (including bad frames) that were 256 to 511 octets in length (this includes FCS octets but excludes framing bits).
EtherStats512to1023Octets	This is the number of frames received/transmitted (including bad frames) that were 512 to 1023 octets in length (this includes FCS octets but excludes framing bits).
EtherStats1024to1518Octets	This is the number of frames received/transmitted (including bad frames) that were 1024 to 1518 octets in length (this includes FCS octets but excludes framing bits).
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt system statistic polling.
Port Clear Counter	Select a port from the <b>Port</b> drop-down list box and then click <b>Clear Counter</b> to erase the recorded statistical information for that port.
Reset	Click this to set the <b>Poll Interval(s)</b> and <b>Port</b> fields to their default values and to refresh the screen.

### 6.1.4 RMON History Screen

Use this screen to display general information (such as sample time) on history samples. To open this screen, click any port number in the **RMON Statistics** screen.

**Figure 37** Port Statistics (RMON History)

Sample Index	Interval Start	Pkts	BroadcastPkts	MulticastPkts	Utilization
1947	16:13:15	45	45	0	0
1946	16:12:45	85	85	0	0
1945	16:12:15	74	74	0	0
1900	15:49:45	44	44	0	0
1899	15:49:15	62	62	0	0
1898	15:48:45	50	50	0	0

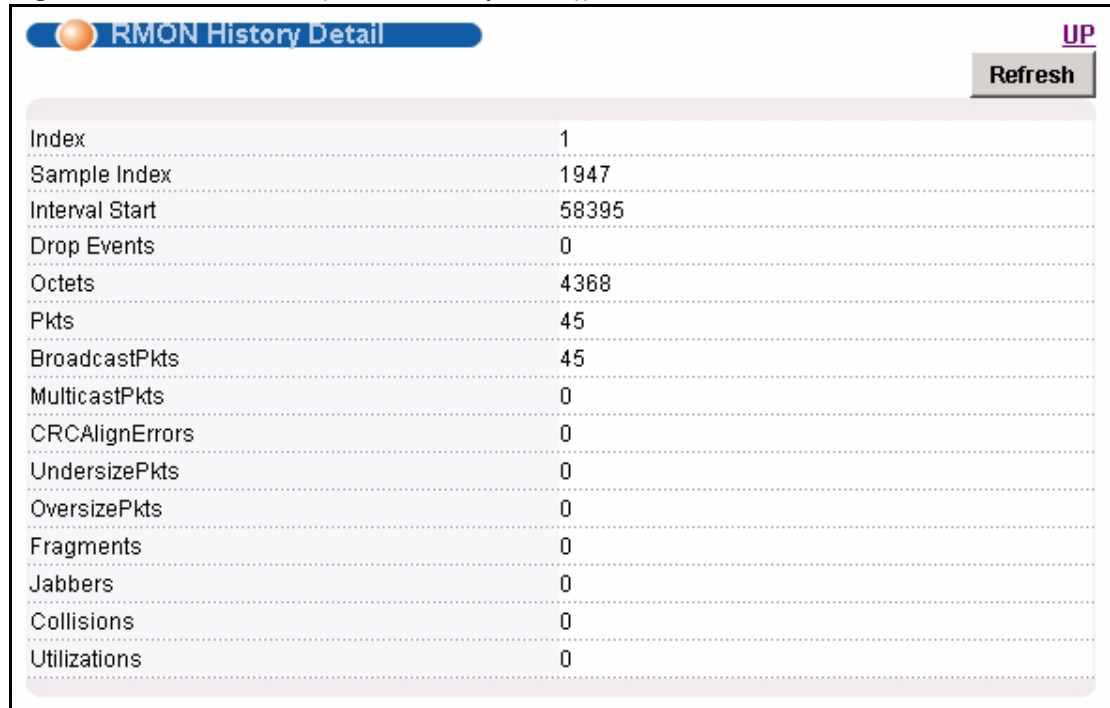
The following table describes the labels in this screen.

**Table 9** Port Statistics (RMON History)

LABEL	DESCRIPTION
Index:Interval	Select the index of the sample interval and the desired data sampling time (in seconds).
Apply	Click this to use the selected data sampling time.
Refresh	Click this to update this screen.
Sample Index	This field display the sample number.
Interval Start	This field displays the data sampling time.
Pkts	This field displays the number of packets received or transmitted since the last sample time.
BroadcastPkts	This field displays the number of broadcast packets received or transmitted since the last sample time.
MulticastPkts	This field displays the number of multicast packets received/transmitted since the last sample time.
Utilization	This field displays the port utilization status.

### 6.1.5 RMON History Detail Screen

Use this screen to display detailed RMON history. To open this screen, click any index number in the **RMON History** screen.

**Figure 38** Port Statistics (RMON History Detail)


Index	1
Sample Index	1947
Interval Start	58395
Drop Events	0
Octets	4368
Pkts	45
BroadcastPkts	45
MulticastPkts	0
CRCAlignErrors	0
UndersizePkts	0
OversizePkts	0
Fragments	0
Jabbers	0
Collisions	0
Utilizations	0

The following table describes the labels in this screen.

**Table 10** Port Statistics (RMON History Detail)

LABEL	DESCRIPTION
UP	Click this to return to the previous screen.
Refresh	Click this to update this screen.
Index	This field displays the index of the sample interval.
Sample Index	This field displays the sample number.
Interval Start	This field displays the data sampling time.
Drop Events	This field displays the total number of packets that were dropped in the sampling period.
Octets	This field displays the total number of octets received/transmitted in the sampling period.
Pkts	This field displays the total number of good packets received/transmitted in the sampling period.
BroadcastPkts	This field displays the total number of broadcast packets received/transmitted in the sampling period.
MulticastPkts	This field displays the total number of multicast packets received/transmitted in the sampling period.
CRCAlignErrors	This field displays the total number of CRC (Cyclical Redundancy Check) alignment errors in the sampling period.
UndersizePkts	This field displays the total number of packets that were too small received/transmitted in the sampling period.
OversizePkts	This field displays the total number of packets that were too big received/transmitted in the sampling period.
Fragments	This is the number of frames received/transmitted that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.

**Table 10** Port Statistics (RMON History Detail) (continued)


LABEL	DESCRIPTION
Jabbers	This is the number of frames received/transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
Collisions	This is the number of frames for which transmission failed due to excessive collisions. Excessive collision is defined as the number of maximum collisions before the retransmission count is reset.
Utilizations	This field displays the port utilization status in the sampling period.

# System Information

The **System Information** screen displays general device information (such as firmware version number) and hardware polling information (such as temperature status). You can check the firmware version number and monitor the hardware status in this screen.

To open this screen, click **Basic Setting, System Information**.

**Figure 39** System Info


**System Info**

System Name	AAM1212-51
ZyNOS FW Version	V3.52(ABA.0)   07/07/2006
DSP Code Version	6.04.0003
Hardware Version	
Serial Number	
Ethernet Address	00:13:49:de:00:ad

**Hardware Monitor**  
☒ Enable  
 Temperature Unit C

Temperature- C	Current	MAX	MIN	Average	Threshold( Low)	Threshold( Hi)	Status
1	51	53	48	50	-55	97	Normal
2	57	59	54	56	-55	97	Normal
3	56	58	53	55	-55	97	Normal

Voltage	Current	MAX	MIN	Average	Threshold( Low)	Threshold( Hi)	Status
1	1.152	1.152	1.139	1.146	1.056	1.344	Normal
2	1.820	1.820	1.820	1.820	1.656	1.944	Normal
3	3.200	3.257	3.200	3.200	3.036	3.564	Normal
4	18.175	18.175	18.175	18.175	16.560	19.440	Normal

New threshold **Apply**

Temperature- C ( Hi)	Temperature- C ( Lo)	Volt. ( Hi)	Volt. ( Lo)
97	-55	1.344	1.056
97	-55	1.944	1.656
97	-55	3.564	3.036
		19.440	16.560

Poll Interval( s)

The following table describes the labels in this screen.

**Table 11** System Info

<b>LABEL</b>	<b>DESCRIPTION</b>
System Name	This field displays the device's model name.
ZyNOS F/W Version	This field displays the version number of the device's current firmware including the date created.
DSP Code Version	This field displays the Digital Signal Processor firmware version number. This is the modem code firmware.
Hardware Version	This is the version of the physical device hardware. This field may be blank.
Serial Number	This is the individual identification number assigned to the device at the factory. This field may be blank.
Ethernet Address	This field refers to the Ethernet MAC (Media Access Control) address of the device.
Hardware Monitor	
Enable	Select this check box to turn the hardware monitor on or clear it to turn the hardware monitor off.
Temperature Unit	Select <b>C</b> to display all temperature measurements in degrees Celsius. Select <b>F</b> to display all temperature measurements in degrees Fahrenheit.
Temperature	Each temperature sensor can detect and report the temperature. Temperature sensor 1 is near the DSL chipset. Temperature sensor 2 is near the central processing unit. Temperature sensor 3 is at the hardware monitor chip.
Current	This shows the current temperature at this sensor.
MAX	This field displays the maximum temperature measured at this sensor.
MIN	This field displays the minimum temperature measured at this sensor.
Average	This field displays the average temperature measured at this sensor.
Threshold (Low)	This field displays the lowest temperature limit at this sensor.
Threshold (Hi)	This field displays the highest temperature limit at this sensor.
Status	This field displays <b>Normal</b> for temperatures below the threshold and <b>Over</b> for those above.
Voltage(V)	The power supply for each voltage has a sensor that can detect and report the voltage.
Current	This is the current voltage reading.
MAX	This field displays the maximum voltage measured at this point.
MIN	This field displays the minimum voltage measured at this point.
Average	This field displays the average voltage measured at this sensor.
Threshold (Low)	This field displays the lowest voltage limit at this sensor.
Threshold (Hi)	This field displays the highest voltage limit at this sensor.
Status	<b>Normal</b> indicates that the voltage is within an acceptable operating range at this point; otherwise <b>Abnormal</b> is displayed.
	Use this section of the screen to configure the hardware monitor threshold settings.
New threshold Apply	Configure new threshold settings in the fields below and click <b>Apply</b> to use them.
Temperature (Hi)	Use these fields to configure the highest temperature limit at each sensor.
Temperature (Lo)	Use these fields to configure the lowest temperature limit at each sensor.



**Table 11** System Info (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Volt. (Hi)	Use these fields to configure the highest voltage limit at each sensor.
Volt. (Lo)	Use these fields to configure the lowest voltage limit at each sensor.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt statistic polling.



# General Setup

The **General Setup** screen allows you to configure general device identification information. It also allows you to set the system time manually or get the current time and date from an external server when you turn on your device. The real time is then displayed in the logs.

To open this screen, click **Basic Setting, General Setup**.

**Figure 40** General Setup

The following table describes the labels in this screen.

**Table 12** General Setup

LABEL	DESCRIPTION
Host Name	Choose a descriptive name for identification purposes. This name consists of up to 31 ASCII characters; spaces are allowed.
Location	Enter the geographic location of your device. You can use up to 31 ASCII characters; spaces are allowed.
Contact Person's Name	Enter the name of the person in charge of this device. You can use up to 31 ASCII characters; spaces are allowed.

**Table 12** General Setup (continued)

LABEL	DESCRIPTION
Model	This field displays your device type.
Use Time Server When Bootup	<p>Select the time service protocol that the timeserver uses. Not all time servers support all protocols, so you may have to use trial and error to find a protocol that works. The main differences between them are the time format.</p> <p>When you select the <b>Daytime (RFC 867)</b> format, the switch displays the day, month, year and time with no time zone adjustment. When you use this format it is recommended that you use a Daytime timeserver within your geographical time zone. <b>Time (RFC-868)</b> format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0.</p> <p><b>NTP (RFC-1305)</b> is similar to Time (RFC-868).</p> <p><b>None</b> is the default value. Enter the time manually. Each time you turn on the device, the time and date will be reset to 2000-1-1 0:0.</p>
Time Server IP Address	Enter the IP address of your timeserver. The device searches for the timeserver for up to 60 seconds.
Current Time	This field displays the time you open this menu (or refresh the menu).
New Time (hh:min:ss)	Enter the new time in hour, minute and second format. The new time then appears in the <b>Current Time</b> field after you click <b>Apply</b> .
Current Date	This field displays the date you open this menu.
New Date (yyyy-mm-dd)	Enter the new date in year, month and day format. The new date then appears in the <b>Current Date</b> field after you click <b>Apply</b> .
Time Zone	Select the time difference between UTC (Universal Time Coordinated, formerly known as GMT, Greenwich Mean Time) and your time zone from the drop-down list box.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

# User Account

The **User Account** screens allows you to set up and configure system administrator accounts for the IES-612-51. You can also configure the authentication policy for IES-612-51 administrators. This is different than port authentication in [Chapter 23 on page 181](#).

See [Chapter 23 on page 181](#) for background information on authentication.

## 9.1 User Account Screen

To open this screen, click **Basic Setting, User Account**.

**Figure 41** User Account

Index	Enable	Name	Privilege	Select
1	V	admin	high	<input type="checkbox"/>

The following table describes the labels in this screen.

**Table 13** User Account

LABEL	DESCRIPTION
Authentication	Click this to open the <b>Authentication</b> screen. See <a href="#">Section 9.2 on page 94</a> .
Enable	Select this check box to turn on the administrator account.
Name	Enter a user name for the administrator account.
Password	Enter a password for the administrator account.
Retype Password to Confirm	Re-enter the administrator account's password to verify that you have entered it correctly.

**Table 13** User Account (continued)

LABEL	DESCRIPTION
Privilege	Select a privilege level to determine which screens the administrator can use. There is a high, medium or low privilege level for each command. Select <b>high</b> to allow the administrator to use all commands including the lower privilege commands. High privilege commands include things like creating administrator accounts, restarting the system and resetting the factory defaults. Select <b>middle</b> to allow the administrator to use middle or low privilege commands. Select <b>low</b> to allow the administrator to use only low privilege commands. Low privilege commands are read only.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields again.
Index	This field displays the number of the user account. Click an account's index number to use the top of the screen to edit it.
Enable	This field displays a "V" if you have the administrator account turned on. It displays a "-" if the administrator account is turned off.
Name	This field displays the administrator account's user name.
Privilege	This field displays the administrator account's access level (high, middle or low).
Select	Select this check box and click the <b>Delete</b> button to remove an administrator account.
Delete	Select an administrator account's check box and click this button to remove the administrator account.
Cancel	Click <b>Cancel</b> to start configuring the screen afresh.

## 9.2 Authentication Screen

Use this screen to set up the authentication policies and settings by which administrators can access the IES-612-51.

To open this screen, click **Basic Setting, User Account, Authentication**.

**Figure 42** Authentication

The following table describes the labels in this screen.

**Table 14** User Account

LABEL	DESCRIPTION
User account	Click this to open the <b>User Account</b> screen. See <a href="#">Section 9.1 on page 93</a> .
Authentication Mode	Select the process by which the IES-612-51 authenticates administrators. <b>local</b> - Search the local database. You maintain this database in the <b>User Account</b> screen. <b>radius</b> - Check an external RADIUS database using the settings below. <b>local then radius</b> - Search the local database; if the user name is not found, check an external RADIUS database using the settings below.
IP	Enter the IP address of the external RADIUS server in dotted decimal notation.
Port	The default UDP port of the RADIUS server for authentication is <b>1812</b> . You need not change this value unless your network administrator instructs you to do so.
Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external RADIUS server and the switch. This key is not sent over the network. This key must be the same on the external RADIUS server and the switch.
Default Privilege Level	Select the privilege level assigned to administrators in case the external RADIUS database does not provide one. The privilege level determines which screens the administrator can use. There is a high, medium or low privilege level for each command. You can also choose to deny access to the IES-612-51. Select <b>high</b> to allow the administrator to use all commands including the lower privilege commands. High privilege commands include things like creating administrator accounts, restarting the system and resetting the factory defaults. Select <b>middle</b> to allow the administrator to use middle or low privilege commands. Select <b>low</b> to allow the administrator to use only low privilege commands. Low privilege commands are read only. Select <b>deny</b> to prevent the administrator from accessing the IES-612-51.





# Switch Setup

The **Switch Setup** screen allows you to set up and configure global device features.

## 10.1 GARP Timer Setup

GARP (Generic Attribute Registration Protocol) allows network devices to register and de-register attribute values with other GARP participants within a bridged LAN. GARP is a protocol that provides a generic mechanism for protocols that serve a more specific application, for example, GVRP (GARP VLAN Registration Protocol). GARP and GVRP are the protocols used to automatically register VLAN membership across switches.

Switches join VLANs by making a declaration. A declaration is made by issuing a **Join** message using GARP. Declarations are withdrawn by issuing a **Leave** message. A **Leave All** message terminates all registrations. GARP timers set declaration timeout values.

## 10.2 Switch Modes

The IES-612-51 supports standalone and daisychain switch modes.

### 10.2.1 Standalone Switch Mode

“Standalone switch mode” relates to the IES-612-51’s operational behavior, not a standalone network topology. The standalone switch mode allows either or both of the IES-612-51’s Ethernet ports to connect to the backbone Ethernet network. You can also connect one of the IES-612-51’s Ethernet ports to the Ethernet network and the other to another IES-612-51 (see [Figure 43 on page 98](#) for an example). When the IES-612-51 is in standalone mode, you can use it in a network topology that uses loops (you should also enable RSTP). You can have multiple IES-612-51 connected on the same network and set both of them to use standalone mode in order to use them with a network topology that uses loops.

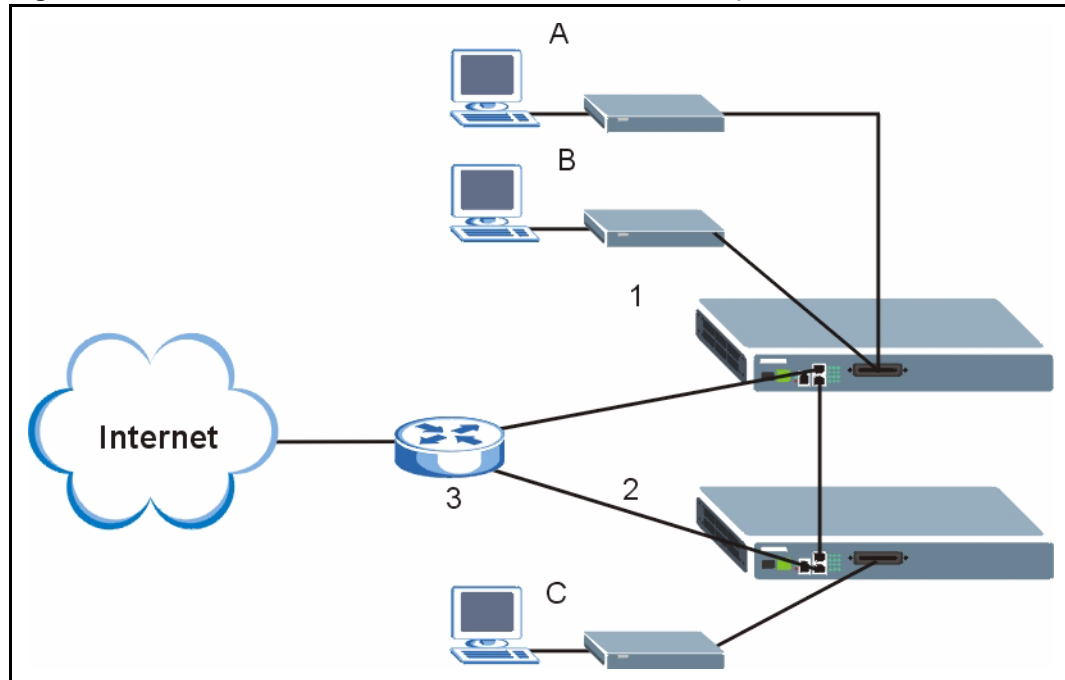
Standalone switch mode with port isolation enabled blocks communications between subscriber ports on an individual IES-612-51. However, one IES-612-51’s subscribers can communicate with another IES-612-51’s subscribers if the two IES-612-51’s Ethernet ports are connected to each other (see [Figure 43 on page 98](#) for an example). If you have multiple IES-612-51 connected on the same network and set to standalone mode, they do not all need to have the same port isolation setting.

## 10.2.2 Port Isolation with Standalone Switch Mode Example

The following graphic shows IES-612-51 **1** and **2** connected to each other and the Ethernet backbone switch (**3**) in a network topology that creates a loop. The IES-612-51 are using the standalone switch mode and have RSTP enabled.

In this example, both IES-612-51 have port isolation turned on. Communications between **A** and **B** must first go through another switch (**3** in the figure). However, **A** and **B** can communicate with **C** without their communications going through another switch or router.

**Figure 43** Port Isolation with Standalone Switch Mode Example



## 10.2.3 Daisychain Switch Mode

Daisychain switch mode sets the IES-612-51 to use Ethernet port one (ENET 1) as an uplink port to connect to the Ethernet backbone and Ethernet port two (ENET 2) to connect to another (daisychained or subtending) IES-612-51. The daisychain switch mode is recommended for use in a network topology that does not have loops. When you daisychain multiple IES-612-51 they must all be set to daisychain mode.

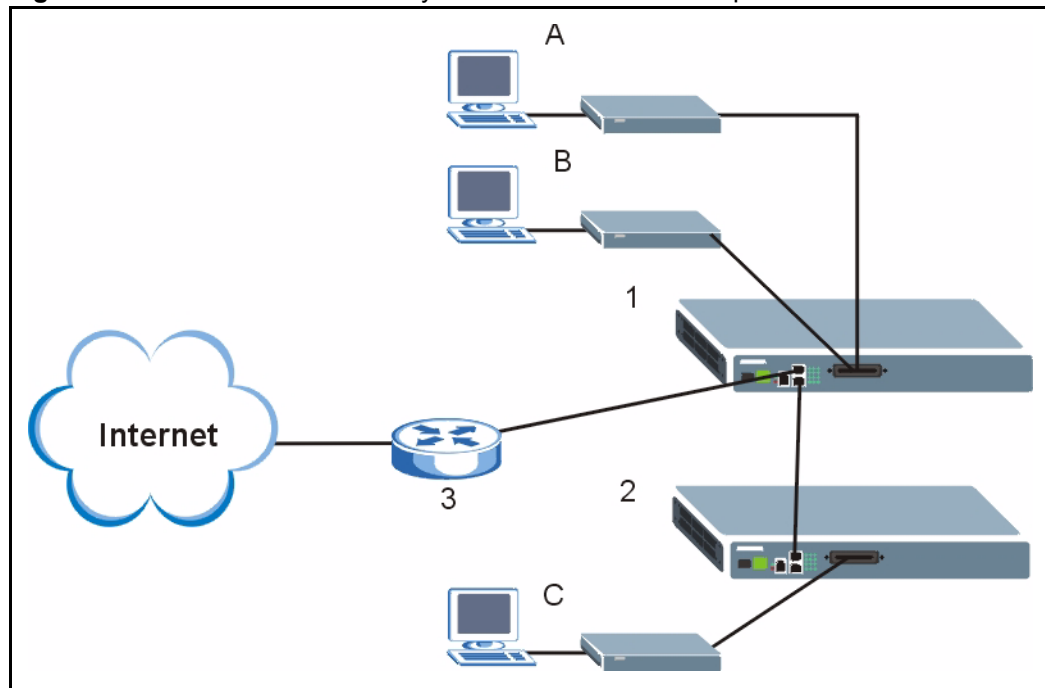
Daisychain switch mode with port isolation enabled blocks communications between subscriber ports on an individual IES-612-51 and between the subscribers of any daisychained IES-612-51 (see [Figure 44 on page 99](#) for an example). Use the same port isolation setting on all IES-612-51 that you set up in a daisychain.

## 10.2.4 Port Isolation with Daisychain Switch Mode Example

In the example below, the IES-612-51 **1** has its Ethernet port one (ENET 1) connected to the Ethernet backbone switch (**3**) and its Ethernet port two (ENET2) connected to Ethernet port one (ENET 1) of the daisychained IES-612-51 (**2**).

With port isolation turned on, communications between **A** and **B** must first go through another switch or router (**3** in the figure). **A** and **B** also cannot communicate with **C** without their communications going through another switch or router.

**Figure 44** Port Isolation with Daisychain Switch Mode Example



## 10.3 Switch Setup Screen

To open this screen, click **Basic Setting, Switch Setup**.

**Figure 45** Switch Setup

**Switch Setup**

MAC Address Learning	Aging Time	300	(10-10000) seconds 0:Disabled
GARP Timer	Join Timer	200	(100-65535) milliseconds
	Leave Timer	600	(Leave Timer must > 2*Join Timer)
	Leave All Timer	10000	(Leave All Timer must > Leave Timer)
Port Isolation	Active	<input checked="" type="checkbox"/>	
MAC Anti-Spoofing	Active	<input type="checkbox"/>	
Switch Mode		Standalone	
Enet Priority Queue Assignment	Priority 7	Queue 3	
	Priority 6	Queue 3	
	Priority 5	Queue 2	
	Priority 4	Queue 2	
	Priority 3	Queue 1	
	Priority 2	Queue 0	
	Priority 1	Queue 0	
	Priority 0	Queue 1	
ADSL Priority Queue Assignment	Priority 7	Queue 7	
	Priority 6	Queue 6	
	Priority 5	Queue 5	
	Priority 4	Queue 4	
	Priority 3	Queue 3	
	Priority 2	Queue 2	
	Priority 1	Queue 1	
	Priority 0	Queue 0	

Apply Cancel

The following table describes the labels in this screen.

**Table 15** Switch Setup

LABEL	DESCRIPTION
MAC Address Learning Aging Time	Enter a time from 10 to 10,000 seconds. This is how long all dynamically learned MAC addresses remain in the MAC address table before they age out (and must be relearned). Enter 0 to disable the aging out of MAC addresses.
	GARP Timer: Switches join VLANs by making a declaration. A declaration is made by issuing a Join message using GARP. Declarations are withdrawn by issuing a Leave message. A Leave All message terminates all registrations. GARP timers set declaration timeout values. Click here for more information on VLANs.
Join Timer	<b>Join Timer</b> sets the duration of the Join Period timer for GVRP in milliseconds. Each port has a Join Period timer. The allowed Join Time range is between 100 and 65535 milliseconds; the default is 200 milliseconds.
Leave Timer	<b>Leave Timer</b> sets the duration of the Leave Period timer for GVRP in milliseconds. Each port has a single Leave Period timer. Leave Time must be two times larger than Join Timer; the default is 600 milliseconds.
Leave All Timer	<b>Leave All Timer</b> sets the duration of the Leave All Period timer for GVRP in milliseconds. Each port has a single Leave All Period timer. Leave All Timer must be larger than Leave Timer.
Port Isolation Active	Turn on port isolation to block communications between subscriber ports. When you enable port isolation you do not need to configure the VLAN to isolate subscribers.

**Table 15** Switch Setup (continued)

LABEL	DESCRIPTION
MAC Anti-Spoofing	Select this if you want the IES-612-51 to generate an alarm and issue a SNMP trap when an existing MAC address appears on another port.
Switch Mode	<p>Select <b>Standalone</b> to use both of the IES-612-51's Ethernet ports (ENET 1 and ENET 2) as uplink ports.</p> <p>Note: Standalone mode is recommended for network topologies that use loops.</p> <p>Use <b>Daisychain</b> mode to cascade (daisychain) multiple IES-612-51. The IES-612-51 uses Ethernet port one (ENET 1) as an uplink port to connect to the Ethernet backbone and uses Ethernet port two (ENET 2) to connect to another (daisychained or subtending) IES-612-51.</p> <p>Note: Daisychain mode is recommended for network topologies that do not use loops.</p>
Priority Queue Assignment	<p>IEEE 802.1p defines up to 8 separate traffic types by inserting a tag into a MAC-layer frame that contains bits to define class of service. Frames without an explicit priority tag are given the default priority of the ingress port. Use the following fields to configure the priority level-to-physical queue mapping.</p> <p>The device has 4 physical queues that you can map to the 8 priority levels for outgoing Ethernet traffic. The device has 8 physical queues that you can map to the 8 priority levels for outgoing DSL traffic. Traffic assigned to higher index queues gets through the device faster while traffic in lower index queues is dropped if the network is congested.</p>
Priority Level	The following descriptions are based on the traffic types defined in the IEEE 802.1d standard (which incorporates IEEE 802.1p).
Priority 7	Typically used for network control traffic such as router configuration messages.
Priority 6	Typically used for voice traffic that is especially sensitive to jitter (jitter is the variations in delay).
Priority 5	Typically used for video that consumes high bandwidth and is sensitive to jitter.
Priority 4	Typically used for controlled load, latency-sensitive traffic such as SNA (Systems Network Architecture) transactions.
Priority 3	Typically used for "excellent effort" or better than best effort and would include important business traffic that can tolerate some delay.
Priority 2	This is for "spare bandwidth".
Priority 1	This is typically used for non-critical "background" traffic such as bulk transfers that are allowed but that should not affect other applications and users.
Priority 0	Typically used for best-effort traffic.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.



## IP Setup

The **IP Setup** screen allows you to configure a device IP address, subnet mask and DNS (domain name server) for management purposes.

To open this screen, click **Basic Setting, IP Setup**.

**Figure 46** IP Setup

The following table describes the labels in this screen.

**Table 16** IP Setup

LABEL	DESCRIPTION
IP	Enter the IP address of your IES-612-51 in dotted decimal notation for example 1.2.3.4.
IP Mask	Enter the IP subnet mask of your IES-612-51 in dotted decimal notation for example 255.255.255.0.
Apply IP setting	Click <b>Apply IP setting</b> to save your changes to the device's IP address and/or subnet mask to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields again.
Default Gateway	Enter the IP address of the default outgoing gateway in dotted decimal notation.
Apply Gateway setting	Click <b>Apply Gateway setting</b> to save your changes to the device's IP address and/or subnet mask to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields again.





## ENET Port Setup

The **ENET Port Setup** screen allows you to configure settings for the Ethernet ports.

To open this screen, click **Basic Setting, ENET Port Setup**.

**Figure 47** ENET Port Setup

Port	Active	Name	Speed Mode	Duplex
ENET1	<input checked="" type="checkbox"/>	enet1	Auto	Full Duplex
ENET2	<input checked="" type="checkbox"/>	enet2	Auto	Full Duplex

Apply Cancel

The following table describes the labels in this screen.

**Table 17** ENET Port Setup

LABEL	DESCRIPTION
Port	This is the port index number.
Active	Select the check box to turn on the port. Clear it to disable the port.
Name	Enter a descriptive name that identifies this port. You can use up to 31 ASCII characters; spaces are allowed.
Speed Mode	<p>Select the type of Ethernet connection for this port. When you don't use auto-negotiation, you must make sure that the settings of the peer Ethernet port are the same in order to connect.</p> <p>Select <b>Auto</b> (auto-negotiation) to have the IES-612-51 automatically determine the type of connection that the Ethernet port has. When the peer Ethernet device has auto-negotiation turned on, the IES-612-51 negotiates with the peer to determine the connection speed. If the peer Ethernet port does not have auto-negotiation turned on, the IES-612-51 determines the connection speed by detecting the signal on the cable and using full duplex.</p> <p>Select <b>10 Copper</b> if the Ethernet port has a 10 MB electrical connection.</p> <p>Select <b>100 Copper</b> if the Ethernet port has a 100 MB electrical connection.</p>
Duplex	The IES-612-51 uses full duplex Ethernet connections by default.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.



# xDSL Port Setup

This chapter explains how to configure settings for profiles and individual ADSL ports. It also covers how to configure virtual channels and virtual channel profiles.

## 13.1 ADSL Standards Overview

These are the ADSL standards and rates that the IES-612-51 supports at the time of writing. The actual transfer rates will vary depending on what the subscriber's device supports, the line conditions and the connection distance.

**Table 18** ADSL Standards Maximum Transfer Rates

STANDARD	MAXIMUM DOWNSTREAM	MAXIMUM UPSTREAM
G.dmt Annex A	8160 Kbps	1024 Kbps
G.dmt Annex B	8160 Kbps	1024 Kbps
ETSI	8160 Kbps	1024 Kbps
ANSI T1.413 issue 2	8160 Kbps	1024 Kbps
ADSL2	12000 Kbps	1200 Kbps
ADSL2 Annex A, L, M	12000 Kbps	2400 Kbps
ADSL2+	25000 Kbps	1200 Kbps
ADSL2+ Annex A, B, M	25000 Kbps	2400 Kbps

## 13.2 Downstream and Upstream

Downstream refers to traffic going out from the IES-612-51 to the subscriber's ADSL modem or router. Upstream refers to traffic coming into the IES-612-51 from the subscriber's ADSL modem or router.

## 13.3 Profiles

A profile is a table that contains a list of pre-configured ADSL settings. Each ADSL port has one (and only one) profile assigned to it at any given time. You can configure multiple profiles, including profiles for troubleshooting. Profiles allow you to configure ADSL ports efficiently. You can configure all of the ADSL ports with the same profile, thus removing the need to configure the ADSL ports one-by-one. You can also change an individual ADSL port by assigning it a different profile.

For example, you could set up different profiles for different kinds of accounts (for example, economy, standard and premium). Assign the appropriate profile to an ADSL port and it takes care of a large part of the port's configuration maximum and minimum transfer rates. You still get to individually enable or disable each port, as well as configure its channels and operational mode.

## 13.4 Interleave Delay

Interleave delay is the wait (in milliseconds) that determines the size of a single block of data to be interleaved (assembled) and then transmitted. Interleave delay is used when transmission error correction (Reed- Solomon) is necessary due to a less than ideal telephone line. The bigger the delay, the bigger the data block size, allowing better error correction to be performed.

Reed-Solomon codes are block-based error correcting codes with a wide range of applications. The Reed-Solomon encoder takes a block of digital data and adds extra "redundant" bits. The Reed-Solomon decoder processes each block and attempts to correct errors and recover the original data.

### 13.4.1 Fast Mode

Fast mode means no interleaving takes place and transmission is faster (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary.

## 13.5 Configured Versus Actual Rate

You configure the maximum rate of an individual ADSL port by modifying its profile (see [Chapter 14 on page 125](#)) or assigning the port to a different profile (see [Section 13.7.1 on page 111](#)). However, due to noise and other factors on the line, the actual rate may not reach the maximum that you specify.

Even though you can specify arbitrary numbers using the Edit Profile screen, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

Regardless of a profile's configured upstream and downstream rates, the IES-612-51 automatically limits the actual rates for each individual port to the maximum speeds supported by the port's ADSL operational mode. For example, if you configure a profile with a maximum downstream rate of 25000 Kbps, and apply it to a port set to use G.dmt, the IES-612-51 automatically uses a maximum downstream rate of 8160 Kbps. This means that if you configure a profile with very high rates, you can still use it with any port. See [Table 18 on page 107](#) for a list of the maximum rates supported by the different ADSL standards.

### 13.6 Default Settings

The default profile always exists and all of the ADSL ports use the default profile settings when the IES-612-51 is shipped. The default profile's name is set to DEFVAL.

See [Chapter 58 on page 385](#) for the settings of the default profile and ADSL port default settings.

### 13.7 xDSL Port Setup Screen

To open this screen, click **Basic Setting**, **xDSL Port Setup**.

**Figure 48** xDSL Port Setup

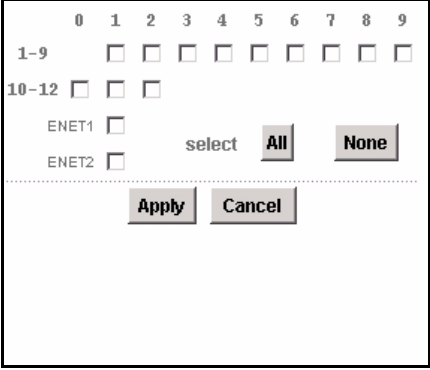
Port	Active	Customer Info	Customer Tel	Profile	Mode	Channels
1	enabled			DEFVAL	auto	1
2	enabled			DEFVAL	auto	1
3	enabled			DEFVAL	auto	1
4	enabled			DEFVAL	auto	1
5	enabled			DEFVAL	auto	1

The following table describes the labels in this screen.

**Table 19** xDSL Port Setup

LABEL	DESCRIPTION
VC Setup	Click <b>VC Setup</b> to open the <b>VC Setup</b> screen where you can configure VC settings for the DSL ports (see <a href="#">Section 13.9 on page 116</a> ).
PPVC Setup	Click <b>PPVC Setup</b> to open the <b>PPVC Setup</b> screen where you can configure priority PVC settings for the DSL ports (see <a href="#">Section 13.11 on page 121</a> ).

**Table 19** xDSL Port Setup (continued)

LABEL	DESCRIPTION
Copy Port Paste	<p>Do the following to copy settings from one DSL port to another DSL port or ports.</p> <ol style="list-style-type: none"> <li>1. Select the number of the DSL port from which you want to copy settings.</li> <li>2. Select the settings that you want to copy.</li> <li>3. Click <b>Paste</b> and the following screen appears.</li> <li>4. Select to which ports you want to copy the settings. Use <b>All</b> to select every port. Use <b>None</b> to clear all of the check boxes.</li> <li>5. Click <b>Apply</b> to paste the settings.</li> </ol> <p><b>Figure 49</b> Select Ports</p> 
Active	Select this check box to copy this port's active setting. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Customer Info	Select this check box to copy this port's subscriber information. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Customer Tel	Select this check box to copy this port's subscriber's telephone number. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
2+ Features	Select this check box to copy this port's ADSL2+ feature settings. These are configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Profile&Mode	Select this check box to copy this port's port profile settings and ADSL operational mode. The port profile settings are configured in the <b>xDSL Port Profile Setup</b> screens (see <a href="#">Chapter 14 on page 125</a> ). The ADSL operational mode is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
IGMP Filter	Select this check box to copy this port's IGMP filter settings. These are configured in the <b>IGMP Filter Profile</b> screen (see <a href="#">Section 14.8 on page 135</a> ).
Security	Select this check box to copy this port's security settings. This is configured in the <b>Port Security</b> screen (see <a href="#">Chapter 24 on page 185</a> ).
Frame Type	Select this check box to copy this port's allowed frame type. This is configured in the <b>Static VLAN Setting</b> screen (see <a href="#">Chapter 22 on page 175</a> ).
Virtual Channels	Select this check box to copy this port's virtual channel settings. These are configured in the <b>VC Setup</b> screen (see <a href="#">Section 13.9 on page 116</a> ).
Alarm Profile	Select this check box to copy this port's alarm profile. This is configured in the <b>Alarm Profile Setup</b> screen (see <a href="#">Section 14.6 on page 133</a> ).
PVID&Priority	Select this check box to copy this port's PVID and priority settings. These are configured in the <b>VLAN Port Setting</b> screen (see <a href="#">Chapter 22 on page 175</a> ).
Packet Filter	Select this check box to copy this port's packet filter settings. These are configured in the <b>Packet Filtering</b> screen (see <a href="#">Chapter 20 on page 171</a> ).
Paste	See <b>Copy Port</b> .

**Table 19** xDSL Port Setup (continued)

LABEL	DESCRIPTION
Port	This field shows each ADSL port number.
Active	This field shows the active status of this port. The port may be <b>enabled</b> or <b>disabled</b> . This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Customer Info	This field shows the customer information provided for this port. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Customer Tel	This field shows the customer telephone number provided for this port. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Profile	This field shows which profile is assigned to this port. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Mode	This field shows which ADSL operational mode the port is set to use. This is configured in the <b>xDSL Port Setting</b> screen (see <a href="#">Section 13.7.1 on page 111</a> ).
Channels	This field displays the number of PVCs (Permanent Virtual Circuits) that are configured for this port. This is configured in the <b>VC Setup</b> screen (see <a href="#">Section 13.9 on page 116</a> ).

### 13.7.1 xDSL Port Setting Screen

To open this screen, click **Basic Setting**, **xDSL Port Setup**, and then click a port's index number.

**Figure 50** xDSL Port Setting

**xDSL Port Setting** [Last Page](#)

**Port 1**

**General Setup**

Active ☒

Customer Info

Customer Tel

Profile **DEFVAL**

Mode **auto**

Alarm Profile **DEFVAL**

IGMP Filter Profile **DEFVAL**

**ADSL 2/2+ feature**

Annex L **disable**

Annex M **disable**

Annex I **disable**

PMM **disable**

SRA **disable**

US INP **0.0** DMT Symbol DS INP **0.0** DMT Symbol

Max US TX PSD **0** -400~40 (0.1 dBm/Hz) Max DS TX PSD **0** -400~40 (0.1 dBm/Hz)

L0 Time **300** 10~65535 (sec, default:300) L2 Time **30** 10~65535 (sec, default:30)

L2 ATPR **1** 0~15 (dB, default:1) L2 ATPRT **6** 0~15 (dB, default:6)

Max L2 Rate **4096** 32~4096 (Kbps, 4 Kbps resolution, default:4096)

Min L2 Rate **32** 32~4096 (Kbps, 4 Kbps resolution, default:32)

L0 to L2 Rate **16** (<= Min L2 Rate / 2 and >= 16 Kbps, default:16)

	Mask0	Mask1	Mask2	Mask3	Mask4	Mask5	Mask6	Mask7
US Carrier (0~63)	00000000	00000000						
DS Carrier0 (32~255)		00000000	00000000	00000000	00000000	00000000	00000000	00000000
DS Carrier1 (256~511)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000

bit '1' indicates the bin is masked off

**Apply** **Cancel**

The following table describes the labels in this screen.

**Table 20** xDSL Port Setting

LABEL	DESCRIPTION
Last Page	Click this to return to the previous screen.
General Setup	
Active	Select this check box to turn on this ADSL port.
Customer Info	Enter information to identify the subscriber connected to this ADSL port. You can use up to 31 printable ASCII characters (including spaces and hyphens).
Customer Tel	Enter information to identify the telephone number of the subscriber connected to this ADSL port. You can use up to 15 ASCII characters (including spaces and hyphens).
Profile	Select a profile of ADSL settings (such as the transfer rate, interleave delay and signal to noise ratio settings) to assign to this port. Use the <b>Port Profile</b> screen to configure port profiles (see <a href="#">Chapter 14 on page 125</a> ).
Mode	Select the port's ADSL operational mode. Select the mode that the subscriber's device uses or <b>auto</b> to have the IES-612-51 automatically determine the mode to use. See <a href="#">Table 18 on page 107</a> for information on the individual ADSL modes.



**Table 20** xDSL Port Setting (continued)

LABEL	DESCRIPTION
Alarm Profile	Select the port's alarm profile. The alarm profile defines alarm thresholds for the ADSL port. The IES-612-51 sends an alarm trap and generates a syslog entry when the thresholds of the alarm profile are exceeded (see <a href="#">Section 14.6 on page 133</a> ).
IGMP Filter Profile	The IGMP filter profile defines which multicast groups a port can join. Select a profile of IGMP filter settings to assign to this port. Use the <b>IGMP Filter Profile</b> screen to configure IGMP filter profiles (see <a href="#">Section 14.8 on page 135</a> ).
ADSL2/2+ feature	These are features available with ADSL2/2+. The subscriber's ADSL device must also support the individual features in order to use them. At the time of writing these features have not been fully tested and their performance and interoperability cannot be guaranteed.
Annex L	Enable Annex L to use reach extended ADSL2. This allows increased connection distances.
Annex M	Enable Annex M to use double upstream mode. This has the upstream connection use tones 6 to 63.
Annex I	<p>Enable Annex I to use all digital mode. With Annex I, the ADSL connection uses the full spectrum of the physical line and the user can not use POTS or ISDN service. This increases the upstream data rate.</p> <p><b>Note:</b> The subscriber cannot use POTS or ISDN services when you enable Annex I.</p>
PMM	<p>Enable the Power ManageMent (PMM) feature to reduce the amount of power used overall and reduce the instances of the connection going down. PMM increases or decreases the transmission power based on line conditions. PMM also decreases the number of service interruptions.</p> <p>Select <b>L2</b> to have the ADSL connection use power saving mode and reduce the rate when there is no traffic. The rate comes back up when there is traffic.</p> <p>Select <b>L3</b> to use both power management modes L2 and L3. L3 puts the ADSL connection to sleep mode.</p> <p>L0 power mode uses no power reduction. See the ITU-T G.992.3 standard for more on PMM and the power modes (states).</p>
SRA	Enable Seamless Rate Adaptation (SRA) to have the IES-612-51 automatically adjust the connection's data rate according to line conditions without interrupting service.
	Sudden spikes in the line's noise level (impulse noise) can cause errors and result in lost packets. Set the impulse noise protection minimum to have a buffer to protect the ADSL physical layer connection against impulse noise. This buffering causes a delay that reduces transfer speeds. It is recommended that you use a non-zero setting for real time traffic that has no error correction (like videoconferencing).
US INP	Set the minimum upstream (US) impulse noise protection setting.
DS INP	Set the minimum downstream (DS) impulse noise protection setting.
Max US TX PSD	Specify the maximum upstream transmit power. The unit of measure is 0.1 dBm/Hz; for example, to set the maximum upstream transmit power to -10 dBm/Hz, set this value to -100.
Max DS TX PSD	Specify the maximum downstream transmit power. The unit of measure is 0.1 dBm/Hz; for example, to set the maximum downstream transmit power to -10 dBm/Hz, set this value to -100.
L0 Time	Set the minimum time (in seconds) that the ADSL line must stay in L0 power mode before changing to the L2 power mode.

**Table 20** xDSL Port Setting (continued)

LABEL	DESCRIPTION
L2 Time	Set minimum time (in seconds) that the ADSL line must stay in the L2 power mode before reducing the power again in the L2 power mode.
L2 ATPR	Set the maximum Aggregate Transmit Power Reduction (ATPR) in decibels (dB) that is permitted in a L2 power reduction. The system can gradually decrease the ADSL line transmission power while it is in the L2 power mode. This is the largest individual power reduction allowed in the L2 power mode.
L2 ATPRT	Set the maximum Aggregate Transmit Power Reduction Total (ATPRT) in decibels (dB) that is permitted in the L2 power mode. This is the total transmit power decrease that is allowed to occur in the L2 power mode.
Max L2 Rate	Set the maximum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39, for example, the system will use 36.
Min L2 Rate	Set the minimum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39, for example, the system will use 36.
L0 to L2 Rate	Set the down stream transfer rate (in Kilobits per second) that serves as the threshold for whether the port is to use the L0 or the L2 power mode. The system changes from L0 mode to L2 mode when the downstream transfer rate stays below this threshold for <b>L0 Time</b> . The system changes back from L2 mode to L0 mode when the downstream transfer rate goes above this threshold. This rate must be less than or equal to one half of the <b>Min L2 Rate</b> and at least 16 Kbps.
Use this part of the screen to mask carrier tones. Masking a carrier tone disables the use of that tone on the ADSL port. Do this to have the system not use an ADSL line's tones that are known to have a high noise level. Each mask can use up to 8 hexadecimal digits (00000000~ffffff). Each hexadecimal digit represents 4 tones. The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. The most significant bit defines the lowest tone number in a mask.	
US Carrier	<b>Mask0</b> represents tones 0~31. <b>Mask1</b> represents tones 32~63. The most significant bit defines Tone 0. In other words, 0x00000001 means tone 31. For example, you could use 0xffff000 to disable upstream carrier tones 0~19 and leave tones 20 ~ 31 enabled.
DS Carrier0 (32~255)	<b>Mask1</b> represents tones 32~63 <b>Mask2</b> represents tones 64~95 <b>Mask3</b> represents tones 96~127 <b>Mask4</b> represents tones 128~159 <b>Mask5</b> represents tones 160~191 <b>Mask6</b> represents tones 192~223 <b>Mask7</b> represents tones 224~255 For example, use 0x01000000 in <b>Mask2</b> to disable downstream carrier tone 71. Use 0x03000000 in <b>Mask2</b> to disable downstream carrier tones 70 and 71.

**Table 20** xDSL Port Setting (continued)

LABEL	DESCRIPTION
DSL Carrier1 (256~511)	<b>Mask0</b> represents tones 256~287 <b>Mask1</b> represents tones 288~319 <b>Mask2</b> represents tones 320~351 <b>Mask3</b> represents tones 352~383 <b>Mask4</b> represents tones 384~415 <b>Mask5</b> represents tones 416~447 <b>Mask6</b> represents tones 448~479 <b>Mask7</b> represents tones 480~511 For example, use 0x00001000 in <b>Mask1</b> to disable downstream carrier tone 307. Use 0x0000f000 in <b>Mask1</b> to disable downstream carrier tones 304 to 307.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields again.

## 13.8 Virtual Channels

Defining virtual channels (also called Permanent Virtual Circuits or PVCs) allows you to set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them).

For example, you want to give high priority to voice service on one of the ADSL ports.

Use the **Edit Static VLAN** screen to configure a static VLAN on the IES-612-51 for voice on the port.

Use the **ADSL Edit Port Channel Setup** screen to:

- Configure a channel on the port for voice service.
- Set the channel to use the PVID of the static VLAN you configured.
- Assign the channel a high priority.

### 13.8.1 Super Channel

The IES-612-51 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.

### 13.8.2 LLC

**LLC** is a type of encapsulation where one VC (Virtual Circuit) carries multiple protocols with each packet header containing protocol identifying information. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, for example, if charging heavily depends on the number of simultaneous VCs.

### 13.8.3 VC Mux

**VC Mux** is a type of encapsulation where, by prior mutual agreement, each protocol is assigned to a specific virtual circuit, for example, VC1 carries IP, VC2 carries IPX, and so on. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

### 13.8.4 Virtual Channel Profile

Virtual channel profiles allow you to configure the virtual channels efficiently. You can configure all of the virtual channels with the same profile, thus removing the need to configure the virtual channels one-by-one. You can also change an individual virtual channel by assigning it a different profile.

The IES-612-51 provides two default virtual channel profiles: **DEFVAL** (for LLC encapsulation) and **DEFVAL\_VC** (for VC encapsulation). By default, all virtual channels are associated to **DEFVAL**.

## 13.9 VC Setup Screen

Use this screen to view and configure a port's channel (PVC) settings.

To open this screen, click **Basic Setting**, **xDSL Port Setup**, **VC Setup**.

**Figure 51** VC Setup

**VC Setup** [xDSL Port Setup](#) [PPVC Setup](#)

Port: 1 Super Channel: ☐ VPI: 0 VCI: 0

DS VC Profile: DEFVAL US VC Profile: -

PVID: 1 (1-4094) Priority: 0

Add Cancel

Show Port: ALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	0/ 33	DEFVAL/	*	*	<input type="radio"/>
2	2	0/ 33	DEFVAL/	*	*	<input type="radio"/>
3	3	0/ 33	DEFVAL/	*	*	<input type="radio"/>
4	4	0/ 33	DEFVAL/	*	*	<input type="radio"/>
5	5	0/ 33	DEFVAL/	*	*	<input type="radio"/>

Index -1 selected Delete No Channel copied Copy Paste

The following table describes the labels in this screen.


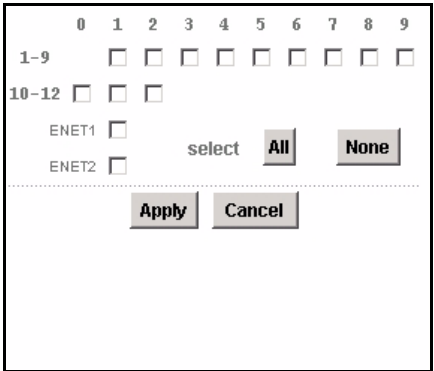
**Table 21** VC Setup

LABEL	DESCRIPTION
xDSL Port Setup	Click <b>xDSL Port Setup</b> to go to the screen where you can configure DSL port settings (see <a href="#">Section 13.7 on page 109</a> ).
PPVC Setup	Click <b>PPVC Setup</b> to open the <b>PPVC Setup</b> screen where you can configure priority PVC settings for the DSL ports (see <a href="#">Section 13.11 on page 121</a> ).
Port	Use this drop-down list box to select a port for which you wish to view or configure settings. This field is read-only once you click on a port number below.
Super Channel	The IES-612-51 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to have this channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.

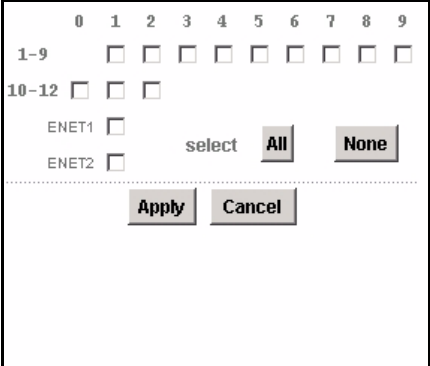
**Table 21** VC Setup (continued)

LABEL	DESCRIPTION
US VC Profile	<p>Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.</p> <p><b>Note:</b> Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.</p>
PVID	Type a PVID (Port VLAN ID) to assign to untagged frames received on this channel.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. An asterisk (*) denotes a super channel.
Add Apply	<p>Click this to add or save channel settings on the selected port. (The name of the button depends on whether or not you have clicked on a PVC number in the <b>Index</b> column.)</p> <p>This saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.</p>
Cancel	Click <b>Cancel</b> to start configuring the screen again.
Show Port	Select the number of an ADSL port for which to display VC settings (or display all of them).
Index	<p>This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC.</p> <p><b>Note:</b> At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.</p>
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
DS / US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel. An asterisk (*) denotes a super channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag. An asterisk (*) denotes a super channel.

**Table 21** VC Setup (continued)

LABEL	DESCRIPTION
<p>Select</p> <p>Delete</p>	<p>Do the following to remove one or more PVCs.</p> <ol style="list-style-type: none"> <li>1 Select a PVC's <b>Select</b> radio button.</li> <li>2 Click <b>Delete</b>.</li> <li>3 Click <b>OK</b> if you want to remove the PVC from other ports. Click <b>Cancel</b> to only remove the one you selected.</li> </ol> <p><b>Figure 52</b> Basic Setting, xDSL Port Setup, VC Setup, Delete</p>  <ol style="list-style-type: none"> <li>4 If you clicked <b>OK</b>, the following screen appears.</li> <li>5 Select to which ports you want to copy the settings. Use <b>All</b> to select every port. Use <b>None</b> to clear all of the check boxes.</li> <li>6 Click <b>Apply</b> to delete the channels.</li> </ol> <p><b>Figure 53</b> Select Ports</p> 

**Table 21** VC Setup (continued)

LABEL	DESCRIPTION
Select Copy Paste	<p>Do the following to copy settings from one PVC to another port or ports.</p> <ol style="list-style-type: none"> <li>1 Click the <b>Select</b> radio button of the PVC from which you want to copy settings.</li> <li>2 Click <b>Paste</b>.</li> <li>3 The following screen appears.</li> <li>4 Select to which ports you want to copy the settings. Use <b>All</b> to select every port. Use <b>None</b> to clear all of the check boxes.</li> <li>5 Click <b>Apply</b> to copy the settings.</li> </ol> <p><b>Figure 54</b> Select Ports</p> 

## 13.10 Priority-based PVCs

A PPVC (Priority-based PVC) allows you to give different priorities to PVCs that are members of the same VLAN.

The IES-612-51 uses eight priority queues (also called levels) for the member PVCs. The system maps frames with certain IEEE 802.1p priorities to a PVC with a particular priority queue. The following table gives the factory default mapping.

**Table 22** IEEE 802.1p Priority to PPVC Mapping

IEEE 802.1 PRIORITY	MAPS TO:	PPVC 0/33, PRIORITY QUEUE
7	->	level 7
6	->	level 6
5	->	level 5
4	->	level 4
3	->	level 3
2	->	level 2
1	->	level 1
0	>	level 0



## 13.11 PPVC Setup Screen

Use this screen to view and configure PPVCs.

To open this screen, click **Basic Setting**, **xDSL Port Setup**, **PPVC Setup**.

**Figure 55** PPVC Setup

Index	Port	VPI/VCI	Encap	PVID	Priority	Members	Delete
1	1	0/ 32	llc	2	0	2	<a href="#">Delete</a>
2	1	0/ 34	vc	1	1	0	<a href="#">Delete</a>
3	2	0/ 36	llc	1	2	0	<a href="#">Delete</a>
4	3	0/ 35	vc	1	0	0	<a href="#">Delete</a>

The following table describes the labels in this screen.

**Table 23** PPVC Setup

LABEL	DESCRIPTION
xDSL Port Setup	Click <b>xDSL Port Setup</b> to go to the screen where you can configure DSL port settings (see <a href="#">Section 13.7 on page 109</a> ).
VC Setup	Click <b>VC Setup</b> to open the <b>VC Setup</b> screen where you can configure VC settings for the DSL ports (see <a href="#">Section 13.9 on page 116</a> ).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
Encap.	Select the encapsulation type ( <b>llc</b> or <b>vc</b> ) for this PPVC.
VPI	Type the Virtual Path Identifier for this PPVC.
VCI	Type the Virtual Circuit Identifier for this PPVC. The IES-612-51 uses this PVC channel internally. This PVC is not needed on the subscriber's device. This PVC cannot overlap with any existing PVCs on this port.
PVID	Type a PVID (Port VLAN ID) to assign to untagged frames received on this PPVC.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Add / Modify	Click <b>Add / Modify</b> to save PPVC settings for a port. In order to change a port's PPVC settings, just select the port from the <b>Port</b> drop-down list box and then configure the settings you want. These settings replace the port's old settings when you click <b>Add / Modify</b> . Clicking <b>Add / Modify</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

**Table 23** PPVC Setup (continued)

LABEL	DESCRIPTION
Show Port	Select the number of an ADSL port for which to display PPVC settings (or display all of them).
Index	This field displays the number of the PPVC.
Port	This field displays the number of the ADSL port on which the PPVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port. The IES-612-51 uses this PVC channel internally. This PVC is not needed on the subscriber's device.
Encap	This field displays the PPVC's type of encapsulation ( <b>llc</b> or <b>vc</b> ).
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
Members	This field displays how many PVCs belong to this PPVC has. Click the number to open a screen where you can configure the PPVC's member PVCs.
Delete	Click <b>Delete</b> to remove a PPVC. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

### 13.11.1 PPVC Setup Members Screen

Use this screen to add and remove member PVCs.



The member PVCs must be created on the subscriber's device.

To open this screen, click **Basic Setting**, **xDSL Port Setup**, **PPVC Setup**. Then, click a PPVC's member number to open the **PPVC Setup Members** screen.

**Figure 56** PPVC Setup, Edit

**PPVC Setup**  
Port 1: 0/32

Index	VPI/VCI	VC Profile	Level	Delete
1	1 / 32	DEFVAL/ DEFVAL	3	<a href="#">delete</a>
2	1 / 34	DEFVAL/ DEFVAL	0	<a href="#">delete</a>

Add VPI  VCI  DS VC Profile

US VC Profile  Level

**Add / Modify** **Close**

The following table describes the labels in this screen.

**Table 24** PPVC Setup, Edit

LABEL	DESCRIPTION
Port	This is the port for which you are viewing or configuring settings.
Index	This field displays the number of the member PVC.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port. The subscriber's device must create this PVC.
VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Level	This field displays the number of the member PVC's priority queue.
Delete	Click <b>Delete</b> to remove a member PVC from the PPVC. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Add	Use this section of the screen to add or modify a member PVC.
VPI	Type the Virtual Path Identifier for this member PVC.
VCI	Type the Virtual Circuit Identifier for this member PPVC. This PVC cannot overlap with any existing PVC's on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.
Level	Use the drop-down list box to select the priority queue (0 to 7) to add to use for the PVC. 7 is the highest level.
Add / Modify	Click <b>Add / Modify</b> to save member PVC settings for a PPVC. In order to change a member PVC 's settings, just enter the PVC's VPI and VCI, and configure the settings you want. These settings replace the PVC's old settings when you click <b>Add / Modify</b> . Clicking <b>Add / Modify</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Close	Click <b>Close</b> to exit the screen without saving your changes.



# xDSL Profiles Setup

A profile is a list of settings that you define. Then you can assign them to one or more individual ports. For background information about many of these settings, see [Chapter 13 on page 107](#).

## 14.1 Port Profile Screen

To open this screen, click **Basic Setting, xDSL Profiles Setup**.

**Figure 57** Port Profile

Index	Name	Latency Mode	Down/Up Stream Rate( kbps)	Select
1	DEFVAL	Interleave	2048/ 512	<input checked="" type="radio"/>
2	DEFVAL_MAX	Interleave	9088/ 512	<input type="radio"/>

Modify Delete

Name

Latency Mode

	Up Stream	Down Stream
Max Rate	<input type="text" value="1000"/> (64-4096)kbps	<input type="text" value="24000"/> (64-32000)kbps
Min Rate	<input type="text" value="32"/> (32-4096)kbps	<input type="text" value="64"/> (32-32000)kbps
Interleave Delay	<input type="text" value="20"/> (1-255) ms	<input type="text" value="20"/> (1-255) ms
Max SNR	<input type="text" value="31"/> (0-31) dB	<input type="text" value="31"/> (0-31) dB
Min SNR	<input type="text" value="0"/> (0-31) dB	<input type="text" value="0"/> (0-31) dB
Target SNR	<input type="text" value="6"/> (0-31) dB	<input type="text" value="6"/> (0-31) dB
Up Shift SNR	<input type="text" value="9"/> (0-31) dB	<input type="text" value="9"/> (0-31) dB
Down Shift SNR	<input type="text" value="3"/> (0-31) dB	<input type="text" value="3"/> (0-31) dB

Add Cancel

The following table describes the labels in this screen.

**Table 25** Port Profile

LABEL	DESCRIPTION
VC Profile	Click <b>VC Profile</b> to open the <b>VC Profile</b> screen where you can configure virtual channel profiles (see <a href="#">Section 14.5 on page 131</a> ).
Alarm Profile	Click <b>Alarm Profile</b> to open the <b>Alarm Profile</b> screen where you can configure limits that trigger an alarm when exceeded (see <a href="#">Section 14.6 on page 133</a> ).

**Table 25** Port Profile (continued)

LABEL	DESCRIPTION
IGMP Filter Profile	Click <b>IGMP Filter Profile</b> to open the <b>IGMP Filter Profile</b> screen where you can configure IGMP multicast filter profiles (see <a href="#">Section 14.8 on page 135</a> ).
Index	This is the port profile index number.
Name	These are the names of individual profiles. The DEFVAL profile always exists and all of the DSL ports have it assigned to them by default. You can use up to 31 ASCII characters; spaces are not allowed.
Latency Mode	This is the ADSL latency mode ( <b>Fast</b> or <b>Interleave</b> ) for the ports that belong to this profile.
Down/Up Stream Rate (kbps)	These are the maximum downstream and upstream transfer rates for the ports that belong to this profile.
Select Modify	Select a profile's <b>Select</b> radio button and click <b>Modify</b> to edit the profile.
Select Delete	Select a profile's <b>Select</b> radio button and click <b>Delete</b> to remove the profile.
	The rest of the screen is for profile configuration.
Name	When editing a profile, this is the name of this profile. When adding a profile, type a name (up to 31 characters) for the profile.
Latency Mode	This field sets the ADSL latency mode for the ports that belong to this profile. Select <b>Fast</b> mode to use no interleaving and have faster transmission (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary. Select <b>Interleave</b> mode to use interleave delay when transmission error correction (Reed- Solomon) is necessary due to a less than ideal telephone line. See <a href="#">Section 13.4 on page 108</a> for more on interleave delay.
Up Stream	The following parameters relate to upstream transmissions.
Max Rate	Type a maximum upstream transfer rate (64 to 4096 Kbps) for this profile. Configure the maximum upstream transfer rate to be less than the maximum downstream transfer rate.
Min Rate	Type the minimum upstream transfer rate (32 to 4096 Kbps) for this port. Configure the minimum upstream transfer rate to be less than the maximum upstream transfer rate.
Interleave Delay	Configure this field when you set the <b>Latency Mode</b> field to <b>Interleave</b> . Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.
Max SNR	Type the maximum upstream signal to noise margin (0-31 dB).
Min SNR	Type the minimum upstream signal to noise margin (0-31 dB). Configure the minimum upstream signal to noise margin to be less than or equal to the maximum upstream signal to noise margin.
Target SNR	Type the target upstream signal to noise margin (0-31 dB). Configure the target upstream signal to noise margin to be greater than or equal to the minimum upstream signal to noise margin and less than or equal to the maximum upstream signal to noise margin.
Up Shift SNR	The upstream up shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes above this number, the device can attempt to use a higher transfer rate. Configure the upstream up shift signal to noise margin to be greater than or equal to the target upstream signal to noise margin and less than or equal to the maximum upstream signal to noise margin.

**Table 25** Port Profile (continued)

LABEL	DESCRIPTION
Down Shift SNR	The upstream down shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes below this number, the device shifts to a lower transfer rate. Configure the upstream down shift signal to noise margin to be less than or equal to the target upstream signal to noise margin and greater than or equal to the minimum upstream signal to noise margin.
Down Stream	The following parameters relate to downstream transmissions.
Max Rate	Type a maximum downstream transfer rate (64 to 32000 Kbps) bps for this port. Configure the maximum downstream transfer rate to be greater than the maximum upstream transfer rate.
Min Rate	Type the minimum downstream transfer rate (32 to 32000 Kbps) for this port. Configure the minimum downstream transfer rate to be less than the maximum downstream transfer rate.
Interleave Delay	Configure this field when you set the <b>Latency Mode</b> field to <b>interleave</b> . Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.
Max SNR	Type the maximum downstream signal to noise margin (0-31 dB).
Min SNR	Type the minimum downstream signal to noise margin (0-31 dB). Configure the minimum downstream signal to noise margin to be less than or equal to the maximum downstream signal to noise margin.
Target SNR	Type the target downstream signal to noise margin (0-31 dB). Configure the target downstream signal to noise margin to be greater than or equal to the minimum downstream signal to noise margin and less than or equal to the maximum downstream signal to noise margin.
Up Shift SNR	The downstream up shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes above this number, the device can attempt to use a higher transfer rate. Configure the downstream up shift signal to noise margin to be greater than or equal to the target downstream signal to noise margin and less than or equal to the maximum downstream signal to noise margin.
Down Shift SNR	The downstream down shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes below this number, the device shifts to a lower transfer rate. Configure the downstream down shift signal to noise margin to be less than or equal to the target downstream signal to noise margin and greater than or equal to the minimum downstream signal to noise margin.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

## 14.2 ATM QoS

ATM Quality of Service (QoS) mechanisms provide the best service on a per-flow guarantee. ATM network infrastructure was designed to provide QoS. It uses fixed cell sizes and built-in traffic management (see [Section 14.3 on page 128](#)). This allows you to fine-tune the levels of services on the priority of the traffic flow.

## 14.3 Traffic Shaping

Traffic shaping is an agreement between the carrier and the subscriber to regulate the average rate and fluctuations of data transmission over an ATM network. This agreement helps eliminate congestion, which is important for transmission of real time data such as audio and video connections.



---

Traffic shaping controls outgoing (downstream) traffic, not incoming (upstream).

---

### 14.3.1 ATM Traffic Classes

These are the basic ATM traffic classes defined by the ATM Forum Traffic Management 4.0 Specification.

#### 14.3.1.1 Constant Bit Rate (CBR)

Constant Bit Rate (CBR) is an ATM traffic class that provides fixed bandwidth. CBR traffic is generally time-sensitive (doesn't tolerate delay). CBR is used for connections that continuously require a specific amount of bandwidth. Examples of connections that need CBR would be high-resolution video and voice.

#### 14.3.1.2 Variable Bit Rate (VBR)

The Variable Bit Rate (VBR) ATM traffic class is used with bursty connections. Connections that use the Variable Bit Rate (VBR) traffic class can be grouped into real time (rt-VBR) or non-real time (nrt-VBR) connections.

The rt-VBR (real-time Variable Bit Rate) type is used with bursty connections that require closely controlled delay and delay variation. An example of an rt-VBR connection would be video conferencing. Video conferencing requires real-time data transfers and the bandwidth requirement varies in proportion to the video image's changing dynamics.

The nrt-VBR (non real-time Variable Bit Rate) type is used with bursty connections that do not require closely controlled delay and delay variation. An example of an nrt-VBR connection would be non-time sensitive data file transfers.

#### 14.3.1.3 Unspecified Bit Rate (UBR)

The Unspecified Bit Rate (UBR) ATM traffic class is similar to the ABR traffic class for bursty data transfers. However, while ABR gives subscribers a set amount of bandwidth, UBR doesn't guarantee any bandwidth and only delivers traffic when the network has spare bandwidth.

### 14.3.2 Traffic Parameters

These are the parameters that control the flow of ATM traffic.



### 14.3.2.1 Peak Cell Rate (PCR)

Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. This parameter may be lower (but not higher) than the maximum line speed. 1 ATM cell is 53 bytes (424 bits), so a maximum speed of 832Kbps gives a maximum PCR of 1962 cells/sec. This rate is not guaranteed because it is dependent on the line speed.

### 14.3.2.2 Sustained Cell Rate (SCR)

Sustained Cell Rate (SCR) is the mean cell rate of each bursty traffic source. It specifies the maximum average rate at which cells can be sent over the virtual connection. SCR may not be greater than the PCR.

### 14.3.2.3 Maximum Burst Size (MBS)

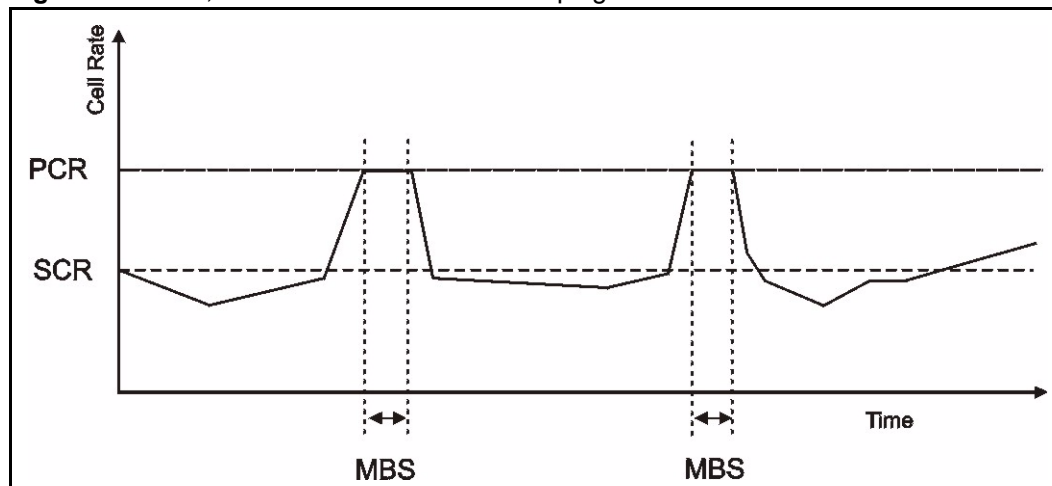
Maximum Burst Size (MBS) is the maximum number of cells that can be sent at the PCR. After MBS is reached, cell rates fall below SCR until cell rate averages to the SCR again. At this time, more cells (up to the MBS) can be sent at the PCR again.



If the PCR, SCR or MBS is set to the default of "0", the system will assign a maximum value that correlates to your upstream line rate.

The following figure illustrates the relationship between PCR, SCR and MBS.

**Figure 58** PCR, SCR and MBS in Traffic Shaping



### 14.3.2.4 Cell Delay Variation Tolerance (CDVT)

Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT controls the time scale over which the PCR is enforced. CDVT is used to determine if a cell arrived too early in relation to PCR.

### 14.3.2.5 Burst Tolerance (BT)

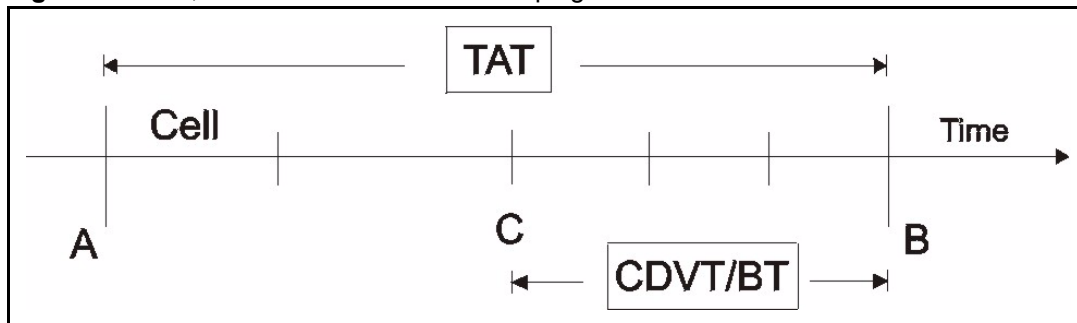
Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT controls the time scale over which the SCR is enforced. BT is used to determine if a cell arrived too early in relation to SCR. Use this formula to calculate BT:  $(MBS - 1) \times (1 / SCR - 1 / PCR) = BT$ .

### 14.3.2.6 Theoretical Arrival Time (TAT)

The Theoretical Arrival Time (TAT) is when the next cell (in an ATM connection's stream of cells) is expected to arrive. TAT is calculated based on the PCR or SCR.

The following figure illustrates the relationship between TAT, CDVT and BT. If a cell arrives at time A, then according to PCR or SCR, the next cell is expected to arrive at time B. If the next cell arrives earlier than time C, it is discarded or tagged for not complying with the TAT. Time C is calculated based on the CDVT or BT.

**Figure 59** TAT, CDVT and BT in Traffic Shaping



## 14.4 Upstream Policing

Upstream policing is an agreement between the carrier and the subscriber to regulate the average rate and fluctuations of data transmission coming from the subscriber's device to the IES-612-51.



Upstream policing controls incoming (upstream) traffic, not outgoing (downstream).

The ATM traffic classes and parameters are identical with downstream shaping.

Upstream policing can control the upstream incoming traffic rate on specific PVCs. Upstream ATM cell traffic that violates the policing profile will be discarded. Traffic shaping must also be enabled on the subscriber's device in order to use upstream policing. If a subscriber attempts to enlarge his device's PVC shaping parameters in order to get more upstream traffic bandwidth, it will violate the IES-612-51's upstream policing profile and the traffic will be discarded. Operators can use this feature to prevent subscribers from changing their device settings.



Traffic shaping must also be enabled on the subscriber's device in order to use upstream policing.

Note that since the IES-612-51 uses ATM QoS, if the subscriber device's upstream shaping rate is larger than the IES-612-51's upstream policing rate, some ATM cells will be discarded. In the worst case, none of the Ethernet packets from the CPE will be able to be reassembled from AAL5, so no packets from the subscriber's device can be received by the IES-612-51.

The upstream policing feature can be enabled/disabled per PVC. No matter which ATM traffic class is used for the PVC's upstream traffic (CBR, VBR, or UBR), the IES-612-51 will drop any upstream traffic that violates the specified ATM VC profile.

## 14.5 VC Profile Screen

To open this screen, click **Basic Setting, xDSL Profiles Setup, VC Profile**.

**Figure 60** VC Profile

The following table describes the labels in this screen.

**Table 26** VC Profile

LABEL	DESCRIPTION
Port Profile	Click <b>Port Profile</b> to configure port profiles and assign them to individual ports (see <a href="#">Section 14.1 on page 125</a> ).
Alarm Profile	Click <b>Alarm Profile</b> to open the <b>Alarm Profile</b> screen where you can configure limits that trigger an alarm when exceeded (see <a href="#">Section 14.6 on page 133</a> ).
IGMP Filter Profile	Click <b>IGMP Filter Profile</b> to open the <b>IGMP Filter Profile</b> screen where you can configure IGMP multicast filter profiles (see <a href="#">Section 14.8 on page 135</a> ).
Index	This is the number of the VC profile.
Name	This name identifies the VC profile.
Encap	This field displays the profile's type of encapsulation ( <b>ilc</b> or <b>vc</b> ).

**Table 26** VC Profile (continued)

LABEL	DESCRIPTION
AAL	This field displays the ATM adaptation layer used by the VC profile. <b>aal5</b> - The VC profile uses ATM adaptation layer 5.
Class	This field displays the type of ATM traffic class: <b>cbr</b> (constant bit rate), <b>vbr</b> (real-time variable bit rate), <b>nrt-vbr</b> (non-real time variable bit rate) or <b>ubr</b> (unspecified bit rate).
PCR	This is the Peak Cell Rate (PCR), the maximum number of cells that the sender can send per second.
CDVT	This field displays the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay.
SCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) in cells per second that can be transmitted. SCR applies with the <b>vbr</b> traffic class.
BT	Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT applies with the <b>vbr</b> traffic class.
Select Modify	Select a VC profile's <b>Select</b> radio button and click <b>Modify</b> to edit the VC profile
Delete	Select a VC profile's <b>Select</b> radio button and click <b>Delete</b> to remove the VC profile
	The rest of the screen is for PVC configuration.
Name	When editing a profile, this is the name of this profile. When adding a profile, type a name for the profile. You can use up to 31 ASCII characters; spaces are not allowed.
Encap	Select the encapsulation type ( <b>LLC</b> or <b>VC</b> ) for this port.
Class	Select <b>CBR</b> (constant bit rate) to specify fixed (always-on) bandwidth for voice or data traffic. Select <b>UBR</b> (unspecified bit rate) for applications that are non-time sensitive, such as e-mail. Select <b>VBR</b> (real time variable bit rate) or <b>NRT-VBR</b> (non real time variable bit rate) for bursty traffic and bandwidth sharing with other applications.
PCR	The Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. PCR applies with all of the ATM traffic classes. You can type a number of (ATM) cells per second in the first field or type a number of kilobytes per second in the second field to have the system automatically compute the number of ATM cells per second.
CDVT	Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT applies with all of the ATM traffic classes. Type the CDVT here.
SCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted. Type the SCR, which must be less than the PCR. SCR applies with the <b>VBR</b> traffic classes. You can type a number of (ATM) cells per second in the first field or type a number of kilobytes per second in the second field to have the system automatically compute the number of ATM cells per second.
BT	Burst Tolerance (BT) sets a maximum number of cells that the port is guaranteed to handle without any discards. Type the BT here. BT applies with the <b>VBR</b> traffic classes.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

## 14.6 Alarm Profile Screen

Alarm profiles define ADSL port alarm thresholds. The IES-612-51 sends an alarm trap and generates a syslog entry when the thresholds of the alarm profile are exceeded.

To open this screen, click **Basic Setting, xDSL Profiles Setup, Alarm Profile**.

Use the top part of the screen (with the **Add** and **Cancel** buttons) to add or edit alarm profiles. The rest of the screen displays the configured alarm profiles.

**Figure 61** Alarm Profile

**Alarm Profile** [Port Profile](#) [VC Profile](#) [IGMP Filter Profile](#)

Name :  **Add** **Cancel**

Threshold	ATU - C	ATU - R	Threshold	ATU - C	ATU - R
15 Min LOF	<input type="text" value="0"/>	<input type="text" value="0"/>	Init Failure Trap	Active <input type="checkbox"/>	
15 Min LOS	<input type="text" value="0"/>	<input type="text" value="0"/>	Fast Rate Up ( bps )	<input type="text" value="0"/>	<input type="text" value="0"/>
15 Min LOL	<input type="text" value="0"/>	<input type="text" value="0"/>	Fast Rate Down ( bps )	<input type="text" value="0"/>	<input type="text" value="0"/>
15 Min LPR	<input type="text" value="0"/>	<input type="text" value="0"/>	Interleave Rate Up ( bps )	<input type="text" value="0"/>	<input type="text" value="0"/>
15 Min ES ( seconds )	<input type="text" value="0"/>	<input type="text" value="0"/>	Interleave Rate Down ( bps )	<input type="text" value="0"/>	<input type="text" value="0"/>
15 Min SES ( seconds )	<input type="text" value="0"/>	<input type="text" value="0"/>			
15 Min UAS( seconds )	<input type="text" value="0"/>	<input type="text" value="0"/>			
15 Min Failed Fast Retrain	<input type="text" value="0"/>				

**Alarm profiles with xDSL port mapping**  
Please click the "-" to mapping a xDSL port to a new alarm profile.

Index	Name								Modify		Delete	
1	2	3	4	5	6	7	8	9	10	11	12	
1	DEFVAL								<a href="#">Modify</a>	<a href="#">Delete</a>		
V	V	V	V	V	V	V	V	V	V	V	V	

The following table describes the labels in this screen.

**Table 27** Alarm Profile

LABEL	DESCRIPTION
Port Profile	Click <b>Port Profile</b> to open the <b>Port Profile</b> screen (see <a href="#">Section 14.1 on page 125</a> ). Use the <b>Port Profile</b> screen to configure profiles of ADSL port settings (such as the transfer rate, interleave delay and signal to noise ratio settings).
VC Profile	Click <b>VC Profile</b> to open the <b>VC Profile</b> screen where you can configure virtual channel profiles (see <a href="#">Section 14.5 on page 131</a> ).
IGMP Filter Profile	Click <b>IGMP Filter Profile</b> to open the <b>IGMP Filter Profile</b> screen where you can configure IGMP multicast filter profiles (see <a href="#">Section 14.8 on page 135</a> ).
Name	This field is read-only if you click <b>Modify</b> to edit a port profile. Type a name to identify the alarm profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

**Table 27** Alarm Profile (continued)

LABEL	DESCRIPTION
Threshold	Specify limits for the individual performance counters. The IES-612-51 sends an alarm trap and generates a syslog entry when one of these thresholds is exceeded. A value of 0 disables the alarm threshold.
ATU-C	These fields are for traffic coming from the subscriber's device to the IES-612-51.
ATU-R	These fields are for traffic going from the IES-612-51 to the subscriber's device.
15 Min LOF	This field sets the limit for the number of Loss Of Frame seconds that are permitted to occur within 15 minutes.
15 Min LOS	This field sets the limit for the number of Loss Of Signal seconds that are permitted to occur within 15 minutes.
15 Min LOL	This field sets the limit for the number of Loss Of Link seconds that are permitted to occur within 15 minutes.
15 Min LPR	This field sets the limit for the number of Loss of Power seconds (on the ATUR) that are permitted to occur within 15 minutes.
15 Min ES (seconds)	This field sets the limit for the number of Errored Seconds that are permitted to occur within 15 minutes.
15 Min SES (seconds)	This field sets the limit for the number of Severely Errored seconds that are permitted to occur within 15 minutes.
15 Min UAS (seconds)	This field sets the limit for the number of UnAvailable seconds that are permitted to occur within 15 minutes.
15 Min Failed Fast Retrain	This field sets the limit for the number of failed fast retrains that are permitted within 15 minutes.
Init Failure Trap	Select <b>Active</b> to trigger an alarm for an initialization failure trap.
Fast Rate Up (bps)	Specify a rate in kilobits per second (kbps). If a fast mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
Fast Rate Down (bps)	Specify a rate in kilobits per second (kbps). If a fast mode connection's downstream transmission rate decreases by more than this number, then a trap is sent.
Interleave Rate Up (bps)	Specify a rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
Interleave Rate Down (bps)	Specify a rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate decreases by more than this number, then a trap is sent.
Alarm profiles with xDSL port mapping	After you add an alarm profile, you can click a port number's "-" symbol to map the xDSL port to that alarm profile. The port's "V" symbol in the alarm profile where it was previously mapped changes to "-".
Modify	Click <b>Modify</b> to edit a profile.
Delete	Click <b>Delete</b> to remove a profile.

## 14.7 IGMP Filtering

With the IGMP filtering feature, you can limit the multicast channel number of IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

You can set the device to filter the multicast group join reports on a per-port basis by configuring an IGMP filtering profile and associating the profile to a port.

## 14.8 IGMP Filter Profile Screen

You can use the IGMP filter profiles to control access to a service that uses a specific multicast group (like a SIP server for example). Configure an IGMP filter profile that allows access to that multicast group. Then assign the IGMP filter profile to ADSL ports that are allowed to use the service.

The **DEFVAL** IGMP filter profile is assigned to all of the ADSL ports by default. It allows a port to join all multicast IP addresses (224.0.0.0~239.255.255.255). If you want to allow an ADSL subscriber access to only specific IGMP multicast groups, use the **IGMP Filter Profile** screen to configure a different profile and then assign it to the subscriber's ADSL port in the **XDSL Port Setting** screen (see [Section 13.7.1 on page 111](#)).

To open this screen, click **Basic Setting**, **xDSL Profiles Setup**, **IGMP Filter Profile**.

The top of the screen displays the configured IGMP filter profiles. Use the bottom part of the screen (with the **Add** and **Cancel** buttons) to add or edit alarm profiles.

**Figure 62** IGMP Filter Profile

**IGMP Filter Profile** Port Profile VC Profile Alarm Profile

Index	Name	Delete
1	DEFVAL	<input type="checkbox"/>

**Delete**

Name

1	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
2	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
3	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
4	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
5	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
6	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
7	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
8	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
9	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
10	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
11	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
12	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
13	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
14	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
15	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>
16	Start IP	<input type="text" value="0.0.0.0"/>	End IP	<input type="text" value="0.0.0.0"/>

**Add** **Cancel**

The following table describes the labels in this screen.

**Table 28** IGMP Filter Profile

LABEL	DESCRIPTION
Port Profile	Click <b>Port Profile</b> to configure port profiles and assign them to individual ports (see <a href="#">Section 14.1 on page 125</a> ).
VC Profile	Click <b>VC Profile</b> to open the <b>VC Profile</b> screen where you can configure virtual channel profiles (see <a href="#">Section 14.5 on page 131</a> ).
Alarm Profile	Click <b>Alarm Profile</b> to open the <b>Alarm Profile</b> screen where you can configure limits that trigger an alarm when exceeded (see <a href="#">Section 14.6 on page 133</a> ).
Index	This is the number of the IGMP filter profile. Click a profile's index number to edit the profile. You cannot edit the <b>DEFVAL</b> profile.
Name	This name identifies the IGMP filter profile.
Delete	Select the <b>Delete</b> check box and click <b>Delete</b> to remove an IGMP filter profile. You cannot delete the <b>DEFVAL</b> profile.
Name	Type a name to identify the IGMP filter profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed.
Start IP	Enter the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.
End IP	Enter the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access. If you want to add a single multicast IP address, enter it in both the <b>Start IP</b> and <b>End IP</b> fields.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.



## xDSL Line Data

### 15.1 xDSL Line Rate Info Screen

This screen displays an ADSL port's line operating values. Information obtained prior to training to steady state transition will not be valid or will be old information.

To open this screen, click **Basic Setting**, **xDSL Line Data**.

**Figure 63** xDSL Line Rate Info

**xDSL Line Rate Info** [Line Performance](#) [Line Data](#)

Port

Port Name	
Rate	Down/up Stream Rate(kbps): 9087/511 Down/up Stream Noise Margin(db): 31.0/25.1 Down/up Stream Attenuation(db): 24.0/2.5 Down/up Stream Attainable Rate(kbps): 28092/1252
Info	Service Mode: adsl2+ Trellis Encoding: On Down Stream Interleave Delay: 3 (ms) Up Stream Interleave Delay: 3 (ms) Down Stream Output power: -2.5 (dbm) Up Stream Output power: 11.5 (dbm) Atur vendor id : b500424434d000000000000000000000 Atur version number: 41327042303139610000000000000000 Atur serial number : 00000000000000000000000000000000 00000000000000000000000000000000 Atuc vendor id : 30304235303035300000000000000000 Atuc version number: 66323333303030300000000000000000 Atuc serial number : 30323030313430336539303030360000 00000000000000000000000000000000

The following table describes the labels in this screen.

**Table 29** xDSL Line Rate Info

LABEL	DESCRIPTION
Line Performance	Click <b>Line Performance</b> to display an ADSL port's line performance counters (see <a href="#">Section 15.2 on page 138</a> ).
Line Data	Click <b>Line Data</b> to display an ADSL port's line bit allocation (see <a href="#">Section 15.3 on page 140</a> ).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click <b>Refresh</b> to display updated information.
Port Name	This section displays the name of the port.

**Table 29** xDSL Line Rate Info (continued)

LABEL	DESCRIPTION
Rate	The rate fields display the transmission rates. "Line Down" indicates that the ADSL port is not connected to a subscriber.
Down/up Stream Rate	These are the rates (in Kbps) at which the port has been sending and receiving data.
Down/up Stream Noise Margin	These are the DSL line's downstream and upstream noise margins. Measured in decibels (dB).
Down/up Stream Attenuation	These are the reductions in amplitude of the downstream and upstream DSL signals. Measured in decibels (dB).
Down/up Stream Attainable Rate	These are the highest theoretically possible transfer rates (in Kbps) at which the port could send and receive data.
Info	
Service Mode	This field displays the ADSL standard that the port is using: G.dmt, G.lite, ANSI T1.413 issue 2, ADSL2, or ADSL2+.
Trellis Encoding	This field displays whether Trellis encoding is turned on or off. Trellis encoding helps to reduce the noise in ADSL transmissions. Trellis may reduce throughput but it makes the connection more stable. <sup>A</sup>
Down Stream Interleave Delay	This field displays the number of milliseconds of interleave delay for downstream transmissions.
Up Stream Interleave Delay	This field displays the number of milliseconds of interleave delay for upstream transmissions.
Down Stream Output Power	This field displays the amount of power that this port is using to transmit to the subscriber's ADSL modem or router. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the more power is needed.
Up Stream Output Power	This field displays the amount of power that the subscriber's ADSL modem or router is using to transmit to this port. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the more power is needed.
Info Atur Info Atuc	<p>The <b>Info Atur</b> fields show data acquired from the ATUR (ADSL Termination Unit – Remote), in this case the subscriber's ADSL modem or router, during negotiation/provisioning message interchanges. This information can help in identifying the subscriber's ADSL modem or router.</p> <p>The <b>Info Atuc</b> fields show data acquired from the ATUC (ADSL Termination Unit – Central), in this case IES-612-51, during negotiation/provisioning message interchanges.</p> <p>The vendor ID, vendor version number and product serial number are obtained from vendor ID fields (see ITU-T G.994.1) or R-MSGS1 (see T1.413).</p>

A. At the time of writing, the IES-612-51 always uses Trellis coding.

## 15.2 xDSL Performance Screen

These counters display line performance data that has been accumulated since the system started. The definitions of near end/far end are always relative to the ATU-C (ADSL Termination Unit-Central Office). ATU-C refers to downstream traffic from the IES-612-51. ATU-R (ADSL Termination Unit-Remote) refers to upstream traffic from the subscriber.

To open this screen, click **Basic Setting, xDSL Line Data, Line Performance**.

**Figure 64** xDSL Performance

xDSL Performance

[Line Rate](#)
[Line Data](#)

Port 2
Refresh

Port Name

Line Type: Fast and Interleave  
Init: 0  
ATUC/ATUR ES: 0/0  
ATUC/ATUR SES: 0/0  
ATUC/ATUR UAS: 0/0  
Fast FEBE: 0 (Far End CRC)  
Fast NEBE: 0 (Near End CRC)  
Fast FE FEC: 0 (Far End Corrected FEC)  
Fast NE FEC: 0 (Near End Corrected FEC)  
Interleaved FEBE: 0 (Far End CRC)  
Interleaved NEBE: 0 (Near End CRC)  
Interleaved FE FEC: 0 (Far End Corrected FEC)  
Interleaved NE FEC: 0 (Near End Corrected FEC)  
LPR: 0

15 min history		lofs	loss	lols	lprs	es	init	ses	uas
Current	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0
Previous 1	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0
Previous 2	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0
Previous 3	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0

1 day history		lofs	loss	lols	lprs	es	init	ses	uas
Current	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0
Previous	ATUC	0	0	0	-	0	0	0	0
	ATUR	0	0	-	0	0	-	0	0

The following table describes the labels in this screen.

**Table 30** xDSL Performance

LABEL	DESCRIPTION
Line Rate	Click <b>Line Rate</b> to display an ADSL port's line operating values (see <a href="#">Section 15.1 on page 137</a> ).
Line Data	Click <b>Line Data</b> to display an ADSL port's line bit allocation (see <a href="#">Section 15.3 on page 140</a> ).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click <b>Refresh</b> to display updated information.
Port Name	This section displays the name of the port.
Performance (since last link up)	

**Table 30** xDSL Performance (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Line Type	“Fast” stands for non-interleaved (fast mode) and “Interleaved” stands for interleaved mode.
Init	This field displays the number of link-ups and link-downs.
ATUC/ATUR ES	The Number of Errored Seconds transmitted (downstream) or received (upstream) on this ADSL port.
ATUC/ATUR SES	The Number of Severely Errored Seconds transmitted (downstream) or received (upstream) on this ADSL port. Severely errored seconds contained 30% or more errored blocks or at least one defect. This is a subset of the <b>Down/Up Stream ES</b> .
ATUC/ATUR UAS	The downstream or upstream number of UnAvailable Seconds.
Fast FEBE	In fast mode, the number of Far End Block Errors (Far End Cyclic Redundancy Checks).
Fast NEBE	In fast mode, the number of Near End Block Errors (Near End Cyclic Redundancy Checks).
Fast FE FEC	In fast mode, the Far End number of ADSL frames repaired by Forward Error Correction.
Fast NE FEC	In fast mode, the Near End number of ADSL frames repaired by Forward Error Correction.
Interleaved FEBE	In interleaved mode, the number of Far End Block Errors (Far End Cyclic Redundancy Checks).
Interleaved NEBE	In interleaved mode, the number of Near End Block Errors (Near End Cyclic Redundancy Checks).
Interleaved FE FEC	In interleaved mode, the Far End number of ADSL frames repaired by Forward Error Correction.
Interleaved NE FEC	In interleaved mode, the Near End number of ADSL frames repaired by Forward Error Correction.
LPR	This is the number of times that the subscriber’s ADSL device has experienced a Loss of Power (been off).
15 min, 1day history	This section of the screen displays line performance statistics for the current and previous 15-minute periods, as well as for the current and previous 24 hours.
lofs	The number of Loss Of Frame Seconds that have occurred within the period.
loss	The number of Loss Of Signal Seconds that have occurred within the period.
lols	The number of Loss Of Link Seconds that have occurred within the period.
lprs	The number of Loss of Power Seconds that have occurred within the period.
es	The number of Errored Seconds that have occurred within the period.
init	The number of successful initializations that have occurred within the period.
ses	The number of Severely Errored Seconds that have occurred within the period.
uas	The number of UnAvailable Seconds that have occurred within the period.

## 15.3 xDSL Line Data Screen

This screen displays an ADSL port’s line bit allocation.

Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into tones. This screen displays the number of bits transmitted for each tone. This can be used to determine the quality of the connection, whether a given sub-carrier loop has sufficient margins to support ADSL transmission rates, and possibly to determine whether certain specific types of interference or line attenuation exist. See the ITU-T G.992.1 recommendation for more information on DMT.

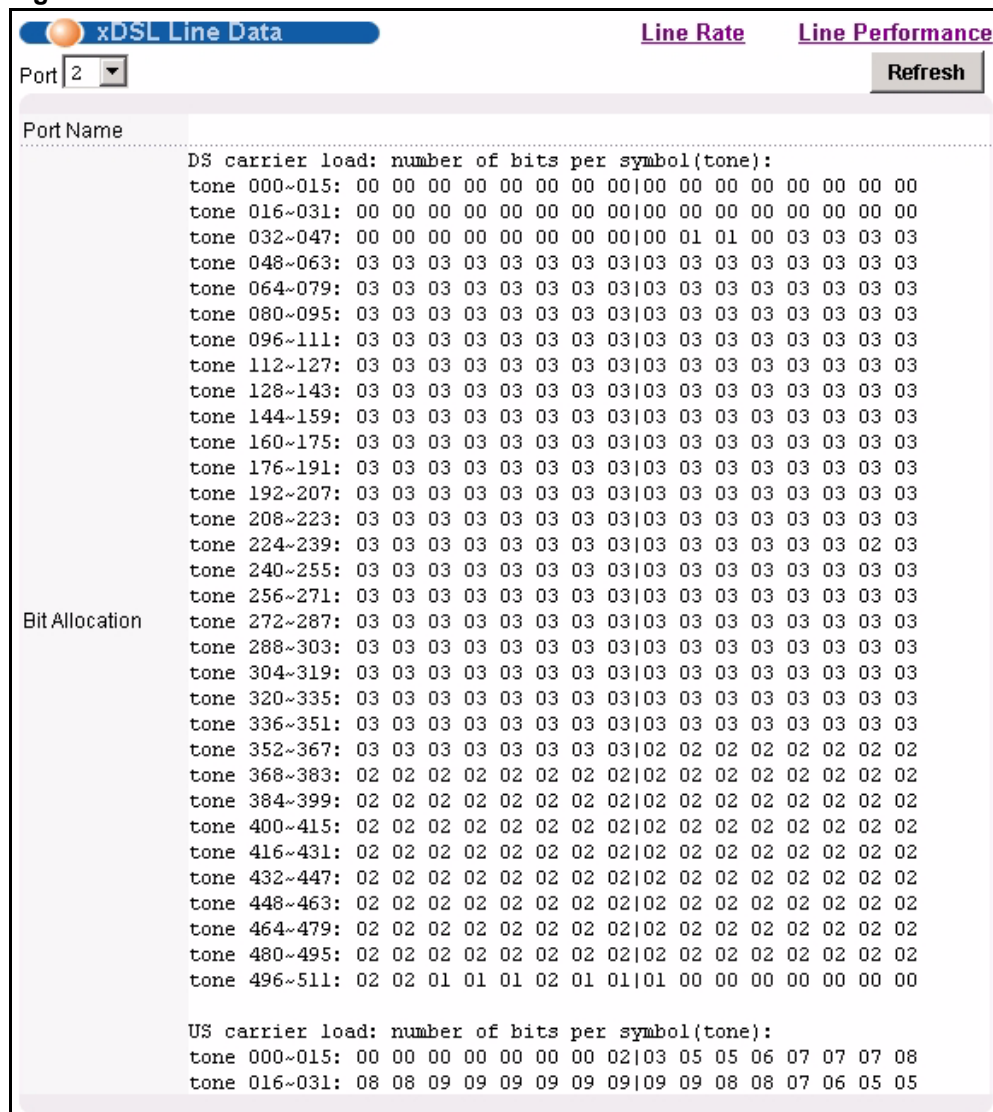
The better (or shorter) the line, the higher the number of bits transmitted for a DMT tone. The maximum number of bits that can be transmitted per DMT tone is 15.

The bit allocation contents are only valid when the link is up.

To open this screen, click **Basic Setting**, **xDSL Line Data**, **Line Data**.

In the screen shown, the downstream channel is carried on tones 48 to 255 and the upstream channel is carried on tones 16 to 31 (space is left between the channels to avoid interference).

**Figure 65** xDSL Line Data



The following table describes the labels in this screen.

**Table 31** xDSL Line Data

LABEL	DESCRIPTION
Line Rate	Click <b>Line Rate</b> to display an ADSL port's line operating values (see <a href="#">Section 15.1 on page 137</a> ).
Line Performance	Click <b>Line Performance</b> to display an ADSL port's line performance counters (see <a href="#">Section 15.2 on page 138</a> ).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click <b>Refresh</b> to display updated information.
Port Name	This section displays the name of the port.
Bit Allocation	"DS carrier load" displays the number of bits transmitted per DMT tone for the downstream channel (from the IES-612-51 to the subscriber's DSL modem or router). "US carrier load" displays the number of bits received per DMT tone for the upstream channel (from the subscriber's DSL modem or router to the IES-612-51).

---

# PART III

## Advanced

## Application

---

VLAN (145)  
IGMP (153)  
Static Multicast (163)  
Multicast VLAN (165)  
Filtering (171)  
MAC Filter (173)  
Spanning Tree Protocol (175)  
Port Authentication (181)  
Port Security (185)  
DHCP Relay (187)  
DHCP Snoop (191)  
RFC 2684 Routed Mode (195)  
PPPoA to PPPoE (203)  
DSCP (209)  
TLS PVC (211)  
ACL (215)  
Downstream Broadcast (221)  
Syslog (223)  
Access Control (225)





This chapter shows you how to configure IEEE 802.1Q tagged VLANs.

## 16.1 Introduction to VLANs

A VLAN (Virtual Local Area Network) allows a physical network to be partitioned into multiple logical networks. Devices on a logical network belong to one group. A device can belong to more than one group. With VLAN, a device cannot directly talk to or hear from devices that are not in the same group(s); the traffic must first go through a router.

In MTU (Multi-Tenant Unit) applications, VLAN is vital in providing isolation and security among the subscribers. When properly configured, VLAN prevents one subscriber from accessing the network resources of another on the same LAN, thus a user will not see the printers and hard disks of another user in the same building.

VLAN also increases network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast packets go to each and every individual port. With VLAN, all broadcasts are confined to a specific broadcast domain.

Note that a VLAN is unidirectional, it only governs outgoing traffic.

## 16.2 Introduction to IEEE 802.1Q Tagged VLAN

Tagged VLAN uses an explicit tag (VLAN ID) in the MAC header to identify the VLAN membership of a frame across bridges - they are not confined to the device on which they were created. The VLANs can be created statically by hand or configured dynamically using GVRP.<sup>1</sup> The VLAN ID associates a frame with a specific VLAN and provides the information that devices need to process the frame across the network. A tagged frame is four bytes longer than an untagged frame and contains two bytes of TPID (Tag Protocol Identifier, residing within the type/length field of the Ethernet frame) and two bytes of TCI (Tag Control Information, starts after the source address field of the Ethernet frame).

The CFI (Canonical Format Indicator) is a single-bit flag, always set to zero for Ethernet switches. If a frame received at an Ethernet port has a CFI set to 1, then that frame should not be forwarded as it is to an untagged port. The remaining twelve bits define the VLAN ID, giving a possible maximum number of 4,096 ( $2^{12}$ ) VLANs. Note that user priority and VLAN ID are independent of each other. A frame with VID (VLAN Identifier) of null (0) is called a

1. GVRP (GARP VLAN Registration Protocol) defines a way for switches to automatically configure switches in a VLAN network.

priority frame, meaning that only the priority level is significant and the default VID of the ingress port is given as the VID of the frame. Of the 4096 possible VIDs, a VID of 0 is used to identify priority frames and value 4095 (FFF) is reserved, so the maximum possible VLAN configurations are 4,094.

TPID 2 Bytes	User Priority 3 Bits	CFI 1 Bit	VLAN ID 12 bits
-----------------	-------------------------	--------------	--------------------

The IES-612-51 handles up to 4094 VLANs (VIDs 1-4094). The device accepts incoming frames with VIDs 1-4094.

### 16.2.1 Forwarding Tagged and Untagged Frames

Each port on the device is capable of passing tagged or untagged frames. To forward a frame from an 802.1Q VLAN-aware switch to an 802.1Q VLAN-unaware switch, the IES-612-51 first decides where to forward the frame and then strips off the VLAN tag. To forward a frame from an 802.1Q VLAN-unaware switch to an 802.1Q VLAN-aware switch, the IES-612-51 first decides where to forward the frame, and then inserts a VLAN tag reflecting the ingress port's default VID. The default PVID is VLAN 1 for all ports, but this can be changed.

The egress (outgoing) port(s) of a frame is determined on the combination of the destination MAC address and the VID of the frame. For a unicast frame, the egress port (based on the destination MAC address) must be a member of the VID, also; otherwise, the frame is blocked. For a broadcast frame, it is duplicated only on ports (except the ingress port itself) that are members of the VID, thus confining the broadcast to a specific domain.

Whether to tag an outgoing frame depends on the setting of the egress port on a per-VLAN, per-port basis (recall that a port can belong to multiple VLANs). If the tagging on the egress port is enabled for the VID of a frame, then the frame is transmitted as a tagged frame; otherwise, it is transmitted as an untagged frame.

## 16.3 VLAN Status Screen

To open this screen, click **Advanced Application, VLAN**.

**Figure 66** VLAN Status

**VLAN Status** [Static VLAN Setting](#) [VLAN Port Setting](#)

The Number Of VLAN = 1  
Page 1 of 1

Index	Status	Name / VID													
Elapsed Time	1	2	3	4	5	6	7	8	9	10	11	12	enet1	enet2	
1	Static	DEFAULT / 1													
0(days) : 19:49:13	U	U	U	U	U	U	U	U	U	U	U	U	U	U	

Poll Interval(s)

Change Pages

The following table describes the labels in this screen.

**Table 32** VLAN Status

LABEL	DESCRIPTION
Static VLAN Setting	Click <b>Static VLAN Setting</b> to configure ports to dynamically join a VLAN group or permanently assign ports to a VLAN group or prohibit ports from joining a VLAN group (see <a href="#">Section 16.4 on page 148</a> ).
VLAN Port Setting	Click <b>VLAN Port Setting</b> to specify Port VLAN IDs (PVIDs). See <a href="#">Section 16.5 on page 149</a> .
The Number of VLAN	This is the number of VLANs configured on the IES-612-51.
Page X of X	This identifies which page of VLAN status information is displayed and how many total pages of VLAN status information there are.
	The first table displays the names of the fields. The subsequent tables show the settings of the VLANs.
Index	This is the VLAN index number.
Name / VID	The name identifies an individual VLAN. The vid is the PVID, the Port VLAN ID assigned to untagged frames or priority-tagged frames received on this port.
1~12, enet1, enet2	These columns display the VLAN's settings for each port. A tagged port is marked as <b>T</b> , an untagged port is marked as <b>U</b> and ports not participating in a VLAN are marked as “-”.
Elapsed Time	This field shows how long it has been since a normal VLAN was registered or a static VLAN was set up.
Status	This field shows that this VLAN was added to the IES-612-51 statically, that is, added as a permanent entry.

**Table 32** VLAN Status (continued)

LABEL	DESCRIPTION
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt polling statistics.
Previous Page Next Page	Click one of these buttons to show the preceding/following screen if the information cannot be displayed in one screen.

## 16.4 Static VLAN Setting Screen

You can assign a port to be a member of a VLAN group or prohibit a port from joining a VLAN group in this screen. This is an IEEE 802.1Q VLAN.

To open this screen, click **Advanced Application, VLAN, Static VLAN Setting**.

**Figure 67** Static VLAN Setting

The following table describes the labels in this screen.

**Table 33** Static VLAN Setting

LABEL	DESCRIPTION
VLAN Status	Click <b>VLAN Status</b> to see which of the IES-612-51's ports are members of which VLANs (see <a href="#">Section 16.3 on page 146</a> )
VLAN Port Setting	Click <b>VLAN Port Setting</b> to specify Port VLAN IDs (PVIDs). See <a href="#">Section 16.5 on page 149</a> .

**Table 33** Static VLAN Setting (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
VID	This field displays the ID number of the VLAN group. Click the number to edit the VLAN settings.
Active	This field indicates whether the VLAN settings are enabled ( <b>Yes</b> ) or disabled ( <b>No</b> ).
Name	This field displays the descriptive name for this VLAN group.
Delete	Select the check boxes of the rule(s) that you want to remove in the <b>Delete</b> column and then click the <b>Delete</b> button. You cannot delete a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Cancel	Click <b>Cancel</b> to clear the <b>Delete</b> check boxes.
Active	Select this check box to enable the VLAN. You cannot disable a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Name	Enter a descriptive name for this VLAN group for identification purposes. Spaces are not allowed.
VLAN ID	Enter the VLAN ID for this static VLAN entry; the valid range is between 1 and 4094.
Port	The port numbers identify the IES-612-51's ports.
Control	Select <b>Fixed</b> for the port to be a permanent member of this VLAN group. Use the <b>Select All</b> button to include every port. Select <b>Forbidden</b> if you want to prohibit the port from joining this VLAN group. Use the <b>Select All</b> button to include every port.
Tagging	Select <b>TX Tagging</b> if you want the port to tag all outgoing frames transmitted with this VLAN ID. Use the <b>All</b> button to include every port. Use the <b>None</b> button to clear all of the ports check boxes.
Add	Click <b>Add</b> to save your settings. The VLAN then displays in the summary table at the top of the screen. Clicking <b>Add</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.

## 16.5 VLAN Port Setting Screen

Use this screen to specify port VLAN IDs and to set whether or not Ethernet ports propagate VLAN information to other devices.

To open this screen, click **Advanced Application, VLAN, VLAN Port Setting**.

**Figure 68** VLAN Port Setting

Port	PVID	Priority	GVRP	Acceptable Frame Type
ENET1	1 (1-4094)	0	<input type="checkbox"/>	ALL
ENET2	1 (1-4094)	0	<input type="checkbox"/>	ALL
1	1 (1-4094)	0	<input type="checkbox"/>	All
2	1 (1-4094)	0	<input type="checkbox"/>	All
3	1 (1-4094)	0	<input type="checkbox"/>	All
4	1 (1-4094)	0	<input type="checkbox"/>	All
5	1 (1-4094)	0	<input type="checkbox"/>	All

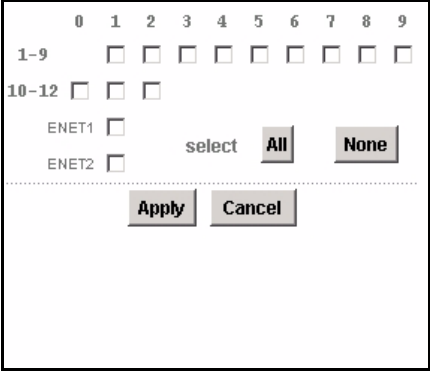
Apply Cancel Copy port 1 Paste

The following table describes the labels in this screen.

**Table 34** VLAN Port Setting

LABEL	DESCRIPTION
VLAN Status	Click <b>VLAN Status</b> to see which of the IES-612-51's ports are members of which VLANs (see <a href="#">Section 16.3 on page 146</a> ).
Static VLAN	Click <b>Static VLAN</b> to configure ports to dynamically join a VLAN group or permanently assign ports to a VLAN group or prohibit ports from joining a VLAN group (see <a href="#">Section 16.4 on page 148</a> ).
Port	The port numbers identify the IES-612-51's ports.
PVID	Type the Port VLAN ID (PVID) from 1 to 4094. The IES-612-51 assigns the PVID to untagged frames or priority frames (0 VID) received on this port.
Priority	Select an IEEE 802.1p priority to assign to untagged frames or priority frames (0 VID) received on this port.
GVRP	Select this check box if the IES-612-51 should use GVRP to automatically register and configure VLAN membership.
Acceptable Frame Type	Select <b>All</b> to have the port accept both tagged and untagged incoming frames. <sup>A</sup> Select <b>Tag Only</b> to have the port only accept incoming frames that have a VLAN tag.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

**Table 34** VLAN Port Setting (continued)

LABEL	DESCRIPTION
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
Copy port Paste	<p>Do the following to copy settings from one port to another port or ports.</p> <ol style="list-style-type: none"><li>1. Select the number of the port from which you want to copy settings.</li><li>2. Click <b>Paste</b> and the following screen appears.</li><li>3. Select to which ports you want to copy the settings. Use <b>All</b> to select every port. Use <b>None</b> to clear all of the check boxes.</li><li>4. Click <b>Apply</b> to paste the settings.</li></ol> <p><b>Figure 69</b> Select Ports</p> 

A. At the time of writing, the **VLAN Acceptable Frame Type** field is read-only for the Ethernet ports. The IES-612-51 accepts both tagged and untagged incoming frames on the Ethernet ports.





This chapter describes the **IGMP** screens.

## 17.1 IGMP

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender to 1 recipient) or Broadcast (1 sender to everybody on the network). Multicast delivers IP packets to just a group of hosts on the network.

IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a multicast group - it is not used to carry user data. See RFC 1112 and RFC 2236 for information on IGMP versions 1 and 2, respectively.

## 17.2 IP Multicast Addresses

In IPv4, a multicast address allows a device to send packets to a specific group of hosts (multicast group) in a different sub-network. A multicast IP address represents a traffic receiving group, not individual receiving devices. IP addresses in the Class D range (224.0.0.0 to 239.255.255.255) are used for IP multicasting. Certain IP multicast numbers are reserved by IANA for special purposes (see the IANA web site for more information).

### 17.2.1 IGMP Snooping

A layer-2 switch can passively snoop on IGMP Query, Report and Leave (IGMP version 2) packets transferred between IP multicast routers/switches and IP multicast hosts to learn the IP multicast group membership. It checks IGMP packets passing through it, picks out the group registration information, and configures multicasting accordingly. IGMP snooping allows the IES-612-51 to learn multicast groups without you having to manually configure them.

The IES-612-51 forwards multicast traffic destined for multicast groups (that it has learned from IGMP snooping or that you have manually configured) to ports that are members of that group. The IES-612-51 discards multicast traffic destined for multicast groups that it does not know. IGMP snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your device.

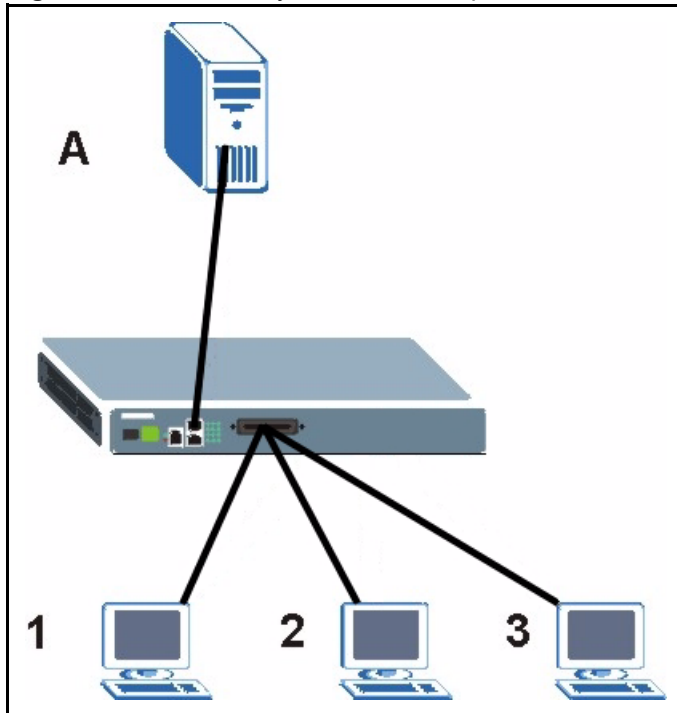
### 17.2.2 IGMP Proxy

To allow better network performance, you can use IGMP proxy instead of a multicast routing protocol in a simple tree network topology.

In IGMP proxy, an upstream interface is the port that is closer to the source (or the root of the multicast tree) and is able to receive multicast traffic. There should only be one upstream interface (also known as the query port) for one query VLAN on the IES-612-51. A downstream interface is a port that connects to a host (such as a computer).

The following figure shows a network example where A is the multicast source while computers 1, 2 and 3 are the receivers. In the figure A is connected to the upstream interface and 1, 2 and 3 are connected to the downstream interface.

**Figure 70** IGMP Proxy Network Example



The IES-612-51 will not respond to IGMP join and leave messages on the upstream interface. The IES-612-51 only responds to IGMP query messages on the upstream interface. The IES-612-51 sends IGMP query messages to the hosts that are members of the query VLAN.

The IES-612-51 only sends an IGMP leave messages via the upstream interface when the last host leaves a multicast group.

In daisychain mode, Ethernet interface 1 is set as the upstream interface and Ethernet interface 2 and the DSL ports are set as downstream interfaces.

## 17.3 IGMP Status Screen

Use this screen to view current IGMP information.

To open this screen, click **Advanced Application, IGMP**.

**Figure 71** IGMP (Status)

**IGMP**

[Bandwidth Setup](#) [IGMP Setup](#) [Filter Setup](#)  
[Count Setup](#) [IGMP Port Info](#) [IGMP Port Group](#)

**Clear**

Query	0
Report	0
Leave	0
Number of IGMP Groups	0

**Previous** **Reload** **Next**

Page 0 of 0

Index	VID	IP Address
1	2	3 4 5 6 7 8 9 10 11 12 ENET1 ENET2

The following table describes the labels in this screen.

**Table 35** IGMP (Status)

LABEL	DESCRIPTION
Bandwidth Setup	Click <b>Bandwidth Setup</b> to open the <b>IGMP Bandwidth</b> screen where you can set up bandwidth requirements for multicast channels (see <a href="#">Section 17.4 on page 156</a> ). You can also open the <b>Bandwidth Port Setup</b> screen to set up multicast bandwidth requirements for selected ports (see <a href="#">Section 17.4.1 on page 157</a> ).
IGMP Setup	Click <b>IGMP Setup</b> to open the <b>IGMP Setup</b> screen where you can configure IGMP settings (see <a href="#">Section 17.5 on page 158</a> ).
Filter Setup	Click <b>Filter Setup</b> to open the <b>IGMP Filter Profile</b> screen where you can configure IGMP multicast filter profiles (see <a href="#">Section 17.6 on page 159</a> ).
Count Setup	Click <b>Count Setup</b> to open the <b>IGMP Count</b> screen where you can limit the number of IGMP groups a subscriber on a port can join (see <a href="#">Section 17.7 on page 159</a> ).
IGMP Port Info	Click <b>IGMP Port Info</b> to open the <b>IGMP Port Info</b> screen where you can look at the current number of IGMP-related packets received on each port (see <a href="#">Section 17.8 on page 160</a> ).
IGMP Port Group	Click <b>IGMP Port Group</b> to open the <b>IGMP Port Group</b> screen where you can look at the current list of multicast groups each port has joined (see <a href="#">Section 17.9 on page 160</a> ).
Clear	Click <b>Clear</b> to delete the information the IES-612-51 has learned about multicast groups. This resets every counter in this screen.
Query	This is the total number of Query packets received.
Report	This is the total number of Report packets received.
Leave	This is the total number of Leave packets received.
Number of IGMP Groups	This is how many IGMP groups the IES-612-51 has identified on the local network.
Previous Next	Click one of these buttons to show the previous/next screen if all of the information cannot be seen in one screen.
Reload	Click this button to refresh the screen.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.

**Table 35** IGMP (Status) (continued)

LABEL	DESCRIPTION
	The first table displays the names of the fields. The subsequent tables show the settings of the IGMP groups.
Index	This is the IGMP group index number.
VID	The VID is the VLAN ID on which the IGMP group is created.
IP Address	This is the IP address of an IP multicast group member.
1~12, enet1, enet2	These columns indicate whether or not each port is a member of the IGMP snooping group.

## 17.4 IGMP Bandwidth Screen

Use this screen to set up bandwidth requirements for multicast channels. To open this screen, click **Advanced Application, IGMP, Bandwidth Setup**.

**Figure 72** IGMP Bandwidth

**IGMP Bandwidth** [Port Setup](#)

Default Bandwidth  (1~100,000)Kbps

**Apply**

Index	Start Multicast IP	End Multicast IP	Bandwidth	Select
1	0.0.0.0 (224.0.0.0~239.255.255.255)	0.0.0.0 (224.0.0.0~239.255.255.255)	512 (1~100,000)Kbps	

**Apply** **Cancel**

**Delete** **Select** **All** **None**

The following table describes the labels in this screen.

**Table 36** IGMP Bandwidth

LABEL	DESCRIPTION
Port Setup	Click <b>Port Setup</b> to open the <b>Bandwidth Port Setup</b> screen where you can set up multicast bandwidth requirements on specified ports (see <a href="#">Section 17.4.1 on page 157</a> ).
Default Bandwidth	Enter the default bandwidth for multicast channels for which you have not configured bandwidth requirements.

**Table 36** IGMP Bandwidth (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	Select a unique number for this setting. If you select a number that is already used, the new setting overwrites the old one when you click <b>Apply</b> .
Start Multicast IP	Enter the beginning of the multicast range.
End Multicast IP	Enter the end of the multicast range. For one multicast address, enter the start of the multicast range again.
Bandwidth	Enter the bandwidth requirement for the specified multicast range.
Apply	Click <b>Apply</b> to save the filter settings. The settings then display in the summary table at the bottom of the screen. Clicking <b>Apply</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.
	This table shows the multicast range settings.
Index	This field displays the number that identifies this setting.
Start Multicast IP	This field displays the beginning of the multicast range.
End Multicast IP	This field displays the end of the multicast range.
Bandwidth	This field displays the allowed bandwidth for the specified multicast range.
Select	Select this, and click <b>Delete</b> to remove the setting.
Delete	Click this to remove the selected settings.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

### 17.4.1 Bandwidth Port Setup Screen

Use this screen to set up multicast bandwidth requirements for specific ports. To open this screen, click **Advanced Application, IGMP, Bandwidth Setup, Port Setup**.

**Figure 73** Bandwidth Port Setup

Port	Active	Bandwidth	Select
1	-	4096 (1~100,000)Kbps	<input type="checkbox"/>
2	-	4096 (1~100,000)Kbps	<input type="checkbox"/>
3	-	4096 (1~100,000)Kbps	<input type="checkbox"/>
4	-	4096 (1~100,000)Kbps	<input type="checkbox"/>
5	-	4096 (1~100,000)Kbps	<input type="checkbox"/>

Active Inactive Select All None

The following table describes the labels in this screen.

**Table 37** Bandwidth Port Setup

LABEL	DESCRIPTION
Bandwidth Setup	Click <b>Bandwidth Setup</b> to open the <b>IGMP Bandwidth</b> screen where you can set up bandwidth requirements for multicast channels (see <a href="#">Section 17.4 on page 156</a> ).
Port	This field shows each DSL port number.
Active	This field shows whether or not multicast bandwidth requirements are enabled on this port. "V" displays if it is enabled and "-" displays if it is disabled.
Bandwidth	Enter the maximum acceptable multicast bandwidth for this port. This has no effect if bandwidth requirements are disabled.
Select	Select this, and click <b>Active</b> or <b>Inactive</b> to enable or disable the specified multicast bandwidth requirements on this port.
Active	Click this to enable the specified multicast bandwidth requirements on the selected port.
Inactive	Click this to disable the specified multicast bandwidth requirements on the selected port.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

## 17.5 IGMP Setup Screen

Use this screen to configure your IGMP settings.

To open this screen, click **Advanced Application, IGMP, IGMP Setup**.

**Figure 74** IGMP Setup

The following table describes the labels in this screen.

**Table 38** IGMP Setup

LABEL	DESCRIPTION
IGMP Status	Click <b>IGMP Status</b> to open the <b>IGMP Setup</b> screen where you can view current IGMP information (see <a href="#">Section 17.3 on page 154</a> ).
Filter Setup	Click <b>Filter Setup</b> to open the <b>IGMP Filter Profile</b> screen where you can configure IGMP multicast filter profiles (see <a href="#">Section 17.6 on page 159</a> ).
IGMP Mode	Select <b>Proxy</b> to have the device use IGMP proxy. Select <b>Snooping</b> to have the device passively learn multicast groups. Select <b>Disable</b> to have the device not use either IGMP proxy or snooping.
Apply	Click <b>Apply</b> to save your IGMP mode settings. Clicking <b>Apply</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

## 17.6 IGMP Filter Setup Screen

To open this screen, click **Advanced Application, IGMP, Filter Setup**. This screen is discussed in [Section 14.8 on page 135](#).

## 17.7 IGMP Count Screen

Use this screen to limit the number of IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

IGMP count is useful for ensuring the service quality of high bandwidth services like video or Internet Protocol television (IPTV). IGMP count can limit how many channels (IGMP groups) the subscriber connected to a DSL port can use at a time. If each channel requires 4~5 Mbps of download bandwidth, and the subscriber’s connection supports 11 Mbps, you can use IGMP count to limit the subscriber to using just 2 channels at a time. This also effectively limits the subscriber to using only two IPTVs with the DSL connection.

To open this screen, click **Advanced Application, IGMP, Count Setup**.

**Figure 75** IGMP Count

Port	Active	Count	Select
1	-	5 (0~16)	<input type="checkbox"/>
2	-	5 (0~16)	<input type="checkbox"/>
3	-	5 (0~16)	<input type="checkbox"/>
4	-	5 (0~16)	<input type="checkbox"/>
5	-	5 (0~16)	<input type="checkbox"/>

Active Inactive Select All None

The following table describes the labels in this screen.

**Table 39** IGMP Count

LABEL	DESCRIPTION
IGMP Status	Click <b>IGMP Status</b> to open the <b>IGMP Setup</b> screen where you can view current IGMP information (see <a href="#">Section 17.3 on page 154</a> ).
Port	This field shows each DSL port number.
Active	This field shows whether or not the IGMP count limit is enabled on this port. “V” displays if it is enabled and “-” displays if it is disabled.
Count	Enter the maximum number of IGMP groups a subscriber on this port can join. This has no effect if the IGMP count limit is disabled.
Select	Select this, and click <b>Active</b> or <b>Inactive</b> to enable or disable the specified IGMP count limit on this port.
Active	Click this to enable the specified IGMP count limits on the selected ports.
Inactive	Click this to disable the specified IGMP count limits on the selected ports.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

## 17.8 IGMP Port Info Screen

Use this screen to display the current number of IGMP-related packets received on each port. To open this screen, click **Advanced Application, IGMP, IGMP Port Info**.

**Figure 76** IGMP Port Info

Port	Group Count	Query Count	Join Count	Leave Count
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
enet1	0	0	0	0
enet2	0	0	0	0

The following table describes the labels in this screen.

**Table 40** IGMP Port Info

LABEL	DESCRIPTION
IGMP Status	Click <b>IGMP Status</b> to open the <b>IGMP Setup</b> screen where you can view current IGMP information (see <a href="#">Section 17.3 on page 154</a> ).
Show Port	Select a port for which you wish to view information.
Port	This field shows each port number.
Group Count	This is the total number of Group packets received on this port.
Query Count	This is the total number of Query packets received on this port.
Join Count	This is the total number of Join packets received on this port.
Leave Count	This is the total number of Leave packets received on this port.
Clear	Click <b>Clear</b> to delete the information the IES-612-51 has learned about multicast groups. This resets every counter in this screen.

## 17.9 IGMP Port Group Screen

Use this screen to display the current list of multicast groups each port joins. To open this screen, click **Advanced Application, IGMP, IGMP Port Group**.

**Figure 77** IGMP Port Group

Port	VID	Multicast IP	Source IP
------	-----	--------------	-----------



The following table describes the labels in this screen.

**Table 41** IGMP Port Group

LABEL	DESCRIPTION
IGMP Status	Click <b>IGMP Status</b> to open the <b>IGMP Setup</b> screen where you can view current IGMP information (see <a href="#">Section 17.3 on page 154</a> ).
Show Port	Select a port for which you wish to view information.
Port	This field shows each port number.
VID	This field shows the associated VLAN ID.
Multicast IP	This field shows the IP address of the multicast group joined by this port.
Source IP	This field shows the IP address of the client that joined the multicast group on this port.
Refresh	Click <b>Refresh</b> to display updated information.



# Static Multicast

This chapter describes the **Static Multicast** screen.

## 18.1 Static Multicast

Use static multicast to allow incoming frames based on multicast MAC address(es) that you specify. This feature can be used in conjunction with IGMP snooping/proxy to allow multicast MAC address(es) that are not learned by IGMP snooping or IGMP proxy. Use static multicast to pass routing protocols, such as RIP and OSPF.

## 18.2 Static Multicast Screen

To open this screen, click **Advanced Application, Static Multicast**.

**Figure 78** Static Multicast

**Static Multicast**  
The Number Of Static Multicast = 1  
Page 1 of 1

Previous Reload Next

Index	MAC Address
1	01:00:5e:12:34:56

Join All Leave All Delete

Adding new entry : : : : :  Add

To join/ leave a multicast group, click the port status.

The following table describes the labels in this screen.

**Table 42** Static Multicast

LABEL	DESCRIPTION
The Number of Static Multicast	This is the number of static multicast entries configured on the IES-612-51.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous Next	Click one of these buttons to show the previous/next screen if all status information cannot be seen in one screen.
Reload	Click this button to refresh the screen.
	The first table displays the names of the fields. The subsequent tables show the settings of the IGMP groups.
Index	This is the static multicast group index number.

**Table 42** Static Multicast (continued)

LABEL	DESCRIPTION
MAC Address	This is the multicast MAC address.
1~12	These fields display the static multicast group membership status of the DSL ports. “V” displays for members and “-” displays for non-members. Click a DSL port’s status to change it (clicking a “V” changes it to “-” and vice versa).
Join All	Click <b>Join All</b> to make all of the DSL ports members of the static multicast group.
Leave All	Click <b>Leave All</b> to remove all of the DSL ports from the static multicast group.
Delete	Click <b>Delete</b> to remove a static multicast group.
Adding new entry Add	Type a multicast MAC address in the field, and click the <b>Add</b> button to create a new static multicast entry. Multicast MAC addresses must be 01:00:5E:xx:xx:xx, where x is a “don’t care” value. For example, 01:00:5E:10:10:10 is a valid multicast MAC address. Clicking <b>Add</b> saves your changes to the IES-612-51’s volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

# Multicast VLAN

This chapter describes the **Multicast VLAN** screens.

## 19.1 Multicast VLAN Overview

Multicast VLAN allows one single multicast VLAN to be shared among different subscriber VLANs on the network. This improves bandwidth utilization by reducing multicast traffic in the subscriber VLANs and simplifies multicast group management.

When the IES-612-51 forwards traffic to a subscriber port, it tries to forward traffic to a normal PVC with the same VLAN ID. If this PVC does not exist, the IES-612-51 uses the super channel instead. This applies to all downstream traffic, not just multicast traffic.

It is suggested to use a super channel for multicast VLAN. If a normal PVC is used and the multicast VLAN ID is not the same as the PVC's VID, the IES-612-51 does not forward traffic to this PVC even if the subscriber's port has joined the multicast VLAN.

Since the IES-612-51 might change the subscriber's VLAN ID to the multicast VLAN ID, both the subscriber's port and the Ethernet port should join the multicast VLAN.

## 19.2 MVLAN Status Screen

Use this screen to look at a summary of all multicast VLAN on the IES-612-51. To open this screen, click **Advanced Application, Multicast VLAN**.

**Figure 79** MVLAN Status

MVLAN Status														
The Number Of MVLAN = 1														
Index	Status			Name / VID										
	1	2	3	4	5	6	7	8	9	10	11	12	ENET1	ENET2
1	Enable			example / 5										
	U	U	U	U	U	U	U	U	U	U	U	U	U	U

The following table describes the labels in this screen.

**Table 43** MVLAN Status

LABEL	DESCRIPTION
MVLAN Setup	Click <b>MVLAN Setup</b> to open the <b>MVLAN Setup</b> screen where you can configure basic settings and port members for each multicast VLAN (see <a href="#">Section 19.3 on page 166</a> ).
MVLAN Group	Click <b>MVLAN Group</b> to open the <b>MVLAN Group</b> screen where you can configure ranges of multicast IP addresses for each multicast VLAN (see <a href="#">Section 19.4 on page 168</a> ).
The Number of MVLAN	This is the number of multicast VLAN configured on the IES-612-51.
	The first table displays the names of the fields. The subsequent tables show the settings for each multicast VLAN.
Index	This is a sequential value and is not associated with this multicast VLAN.
Name / VID	This field shows the name and VLAN ID of this multicast VLAN.
1~12 ENET1-2	These fields display whether or not each port is a member of this multicast VLAN. "V" displays for members and "-" displays for non-members. You can change these settings in the <b>MVLAN Setup</b> screen.
Status	This field shows whether this multicast VLAN is active ( <b>Enable</b> ) or inactive ( <b>Disable</b> ).

## 19.3 MVLAN Setup Screen

Use this screen to configure basic settings and port members for each multicast VLAN. To open this screen, click **Advanced Application**, **Multicast VLAN**, **MVLAN Setup**.

**Figure 80** MVLAN Setup

The following table describes the labels in this screen.

**Table 44** MVLAN Setup

LABEL	DESCRIPTION
MVLAN Status	Click <b>MVLAN Status</b> to open the <b>MVLAN Status</b> screen where you can view a summary of all multicast VLAN on the IES-612-51 (see <a href="#">Section 19.2 on page 165</a> ).
MVLAN Group	Click <b>MVLAN Group</b> to open the <b>MVLAN Group</b> screen where you can configure ranges of multicast IP addresses for each multicast VLAN (see <a href="#">Section 19.4 on page 168</a> ).
VID	This field shows the VLAN ID of each multicast VLAN. Click it to edit its basic settings and port members in the fields below.
Active	This field shows whether this multicast VLAN is active ( <b>Yes</b> ) or inactive ( <b>No</b> ).
Name	This field shows the name of this multicast VLAN.
Delete	Select the check boxes of the rule(s) that you want to remove in the <b>Delete</b> column and then click the <b>Delete</b> button. You cannot delete a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.
Active	Select this if you want the multicast VLAN to be active. Clear this if you want the multicast VLAN to be inactive.
Name	Enter a descriptive name for the multicast VLAN. The name can be 1-31 printable ASCII characters long. Spaces are not allowed.
VLAN ID	Enter the VLAN ID of the multicast VLAN; the valid range is between 1 and 4094.
Port	This field displays each port number.

**Table 44** MVLAN Setup (continued)

LABEL	DESCRIPTION
Control	Select <b>Fixed</b> for the port to be a permanent member of this multicast VLAN. Use the <b>Select All</b> button to include every port. Select <b>Forbidden</b> if you want to prohibit the port from joining this multicast VLAN. Use the <b>Select All</b> button to include every port.
Tagging	Select <b>TX Tagging</b> if you want the port to tag all outgoing frames transmitted with this VLAN ID. Use the <b>All</b> button to include every port. Use the <b>None</b> button to clear all of the ports check boxes.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.

## 19.4 MVLAN Group Screen

Use this screen to configure ranges of multicast IP addresses for each multicast VLAN. To open this screen, click **Advanced Application, Multicast VLAN, MVLAN Group**.

**Figure 81** MVLAN Group

**MVLAN Group** [MVLAN Status](#) [MVLAN Setup](#)

MVLAN ID: 5  
Index: 1  
Start Multicast IP: 0.0.0.0 (224.0.0.0 ~ 239.255.255.255)  
End Multicast IP: 0.0.0.0 (224.0.0.0 ~ 239.255.255.255)

**Apply** **Cancel**

MVLAN ID: 5  
Name: example  
State: Disable

Entry Index	Start Multicast IP	End Multicast IP	Select
1	224.1.1.0	224.1.1.255	<input type="checkbox"/>

**Delete** **Cancel**

The following table describes the labels in this screen.

**Table 45** MVLAN Group

LABEL	DESCRIPTION
MVLAN Status	Click <b>MVLAN Status</b> to open the <b>MVLAN Status</b> screen where you can view a summary of all multicast VLAN on the IES-612-51 (see <a href="#">Section 19.2 on page 165</a> ).
MVLAN Setup	Click <b>MVLAN Setup</b> to open the <b>MVLAN Setup</b> screen where you can configure basic settings and port members for each multicast VLAN (see <a href="#">Section 19.3 on page 166</a> ).



**Table 45** MVLAN Group (continued)

LABEL	DESCRIPTION
MVLAN ID	Select the VLAN ID of the multicast VLAN for which you want to configure a range of multicast IP addresses.
Index	Select the index number of the multicast VLAN group (the range of multicast IP addresses) you want to configure for this multicast VLAN. If you want to change the current settings, select an index number that already exists. If you want to add a new multicast VLAN group, select an index number that does not exist.
Start Multicast IP	Enter the beginning of the range of multicast IP addresses. The IP address must be a valid multicast IP address, between 224.0.0.0 and 239.255.255.255.
End Multicast IP	Enter the end of the range of multicast IP addresses. The IP address must be a valid multicast IP address, between 224.0.0.0 and 239.255.255.255.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.
MVLAN ID	Select the VLAN ID of the multicast VLAN for which you want to look at or remove the multicast IP addresses currently added to it.
Name	This field displays the name of this multicast VLAN.
State	This field shows whether this multicast VLAN is active ( <b>Enable</b> ) or inactive ( <b>Disable</b> ).
Entry Index	This field displays the index number of each multicast VLAN group (the range of multicast IP addresses) configured for this multicast VLAN.
Start Multicast IP	This field displays the beginning of this range of multicast IP addresses.
End Multicast IP	This field displays the end of this range of multicast IP addresses.
Select	Select this, and click <b>Delete</b> to remove the multicast VLAN group.
Delete	Click this to remove the selected multicast VLAN groups.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.



# Filtering

This chapter describes how to configure the **Packet Filter** screen.

## 20.1 Packet Filter Screen

Use this screen to set which types of packets the IES-612-51 accepts on individual DSL ports. To open this screen, click **Advanced Application, Filtering**.

**Figure 82** Packet Filter

Port	PPPoE	IP	ARP	NetBios	DHCP	EAPOL	IGMP	PPPoE Only
1	V	V	V	V	V	V	V	-
2	V	V	V	V	V	V	V	-
3	V	V	V	V	V	V	V	-
4	V	V	V	V	V	V	V	-
5	V	V	V	V	V	V	V	-

The following table describes the labels in this screen.

**Table 46** Packet Filter

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a DSL port for which you wish to configure packet type filtering. This box is read-only after you click on one of the port numbers in the table below.
PPPoE Only	Select this to allow only PPPoE traffic. This will gray out the check boxes for other packet types and the system will drop any non-PPPoE packets.
	Select the check boxes of the types of packets to accept on the DSL port. When you clear one of these check boxes, the field label changes to <b>Filter Out</b> and the system drops the corresponding type of packets

**Table 46** Packet Filter (continued)

LABEL	DESCRIPTION
PPPoE Pass through	Point-to-Point Protocol over Ethernet relies on PPP and Ethernet. It is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem.
IP Pass through	Internet Protocol. The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
ARP Pass through	Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network.
NetBios Pass through	NetBIOS (Network Basic Input/Output System) are TCP or UDP packets that enable a computer to find other computers.
DHCP Pass through	Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses, for a period of time, which means that past addresses are “recycled” and made available for future reassignment to other systems.
EAPOL Pass through	EAP (Extensible Authentication Protocol, RFC 2486) over LAN. EAP is used with IEEE 802.1x to allow additional authentication methods (besides RADIUS) to be deployed with no changes to the access point or the wireless clients.
IGMP Pass through	Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
Add Apply	Click <b>Add</b> or <b>Apply</b> to save the filter settings. The settings then display in the summary table at the bottom of the screen.  Clicking <b>Add</b> or <b>Apply</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring the fields afresh.
	This table shows the DSL port packet filter settings.
Port	These are the numbers of the DSL ports. Click this number to edit the port's filter settings in the section at the top.
PPPoE, IP, ARP, NetBios, DHCP, EAPOL, IGMP, PPPoE Only	These are the packet filter settings for each port. “V” displays for the packet types that the IES-612-51 is to accept on the port. “-” displays for packet types that the IES-612-51 is to reject on the port (packet types that are not listed are accepted). When you select <b>PPPoE Only</b> , “#” appears for all of the packet types. With <b>PPPoE Only</b> , the IES-612-51 rejects all packet types except for PPPoE (packet types that are not listed are also rejected).

# MAC Filter

This chapter introduces the MAC filter.

## 21.1 MAC Filter Introduction

Use the MAC filter to control from which MAC (Media Access Control) addresses frames can (or cannot) come in through a port.

## 21.2 MAC Filter Screen

To open this screen, click **Advanced Application, MAC Filter**.

**Figure 83** MAC Filter

**MAC Filter**

Accept Mode: accept specified MACs but deny others.  
Deny Mode: deny specified MACs but accept others.

Port: 1 MAC: xx:xx:xx:xx:xx:xx

Add Cancel

Port	Mode	Active	MAC	Delete
1	Accept	<input type="checkbox"/>		
2	Accept	<input type="checkbox"/>		
3	Accept	<input type="checkbox"/>		
4	Accept	<input type="checkbox"/>		
5	Accept	<input type="checkbox"/>		

Apply

The following table describes the labels in this screen.

**Table 47** MAC Filter

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a DSL port for which you wish to configure MAC filtering.
MAC	Type a device's MAC address in hexadecimal notation (xx:xx:xx:xx:xx:xx, where x is a number from 0 to 9 or a letter from a to f) in this field. The MAC address must be a valid MAC address.

**Table 47** MAC Filter (continued)

LABEL	DESCRIPTION
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
Port	These are the numbers of the DSL ports.
Mode	Select <b>Accept</b> to only allow frames from MAC addresses that you specify and block frames from other MAC addresses. Select <b>Deny</b> to block frames from MAC addresses that you specify and allow frames from other MAC addresses.
Active	Select this check box to turn on MAC filtering for a port.
MAC	This field lists the MAC addresses that are set for this port.
Delete	Click <b>Delete</b> to remove a MAC address from the list.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

# Spanning Tree Protocol

This chapter introduces the Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP).

## 22.1 RSTP and STP

RSTP adds rapid reconfiguration capability to STP. The IES-612-51 supports RSTP and the earlier STP. RSTP and STP detect and break network loops and provide backup links between switches, bridges or routers. They allow a device to interact with other RSTP or STP-aware devices in your network to ensure that only one path exists between any two stations on the network. The Integrated Ethernet Switch uses RSTP by default but can still operate with STP switches (although without RSTP's benefits).

The root bridge is the base of the spanning tree; it is the bridge with the lowest identifier value (MAC address). Path cost is the cost of transmitting a frame onto a LAN through that port. It is assigned according to the speed of the link to which a port is attached. The slower the media, the higher the cost, as illustrated in the following table.

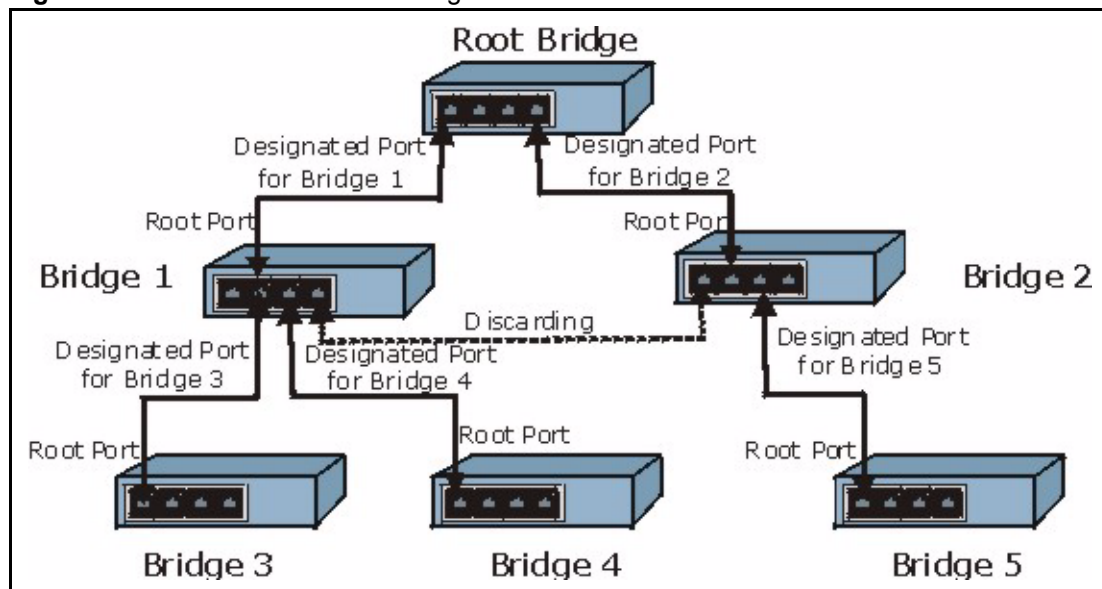
**Table 48** Path Cost

	LINK SPEED	RECOMMENDED VALUE	RECOMMENDED RANGE	ALLOWED RANGE
Path Cost	4Mbps	250	100 to 1000	1 to 65535
Path Cost	10Mbps	100	50 to 600	1 to 65535
Path Cost	16Mbps	62	40 to 400	1 to 65535
Path Cost	100Mbps	19	10 to 60	1 to 65535
Path Cost	1Gbps	4	3 to 10	1 to 65535
Path Cost	10Gbps	2	1 to 5	1 to 65535

On each bridge, the root port is the port through which this bridge communicates with the root. It is the port on this Integrated Ethernet Switch with the lowest path cost to the root (the root path cost). If there is no root port, then this Integrated Ethernet Switch has been accepted as the root bridge of the spanning tree network.

For each LAN segment, a designated bridge is selected. This bridge has the lowest cost to the root among the bridges connected to the LAN.

After a bridge determines the lowest cost-spanning tree with RSTP, it enables the root port and the ports that are the designated ports for the connected LANs, and disables all other ports that participate in RSTP. Network packets are therefore only forwarded between enabled ports, eliminating any possible network loops.

**Figure 84** STP Root Ports and Designated Ports

RSTP-aware devices exchange Bridge Protocol Data Units (BPDUs) periodically. When the bridged LAN topology changes, a new spanning tree is constructed.

In RSTP, the devices send BPDUs every Hello Time. If an RSTP-aware device does not get a Hello BPDU after three Hello Times pass (or the Max Age), the device assumes that the link to the neighboring bridge is down. This device then initiates negotiations with other devices to reconfigure the network to re-establish a valid network topology.

In STP, once a stable network topology has been established, all devices listen for Hello BPDUs transmitted from the root bridge. If an STP-aware device does not get a Hello BPDU after a predefined interval (Max Age), the device assumes that the link to the root bridge is down. This device then initiates negotiations with other devices to reconfigure the network to re-establish a valid network topology.

RSTP assigns three port states to eliminate packet looping while STP assigns five (see [Table 49 on page 176](#)). A device port is not allowed to go directly from blocking state to forwarding state so as to eliminate transient loops.

**Table 49** RSTP Port States

RSTP PORT STATE	STP PORT STATE	DESCRIPTION
Discarding	Disabled	RSTP or STP is disabled (default).
Discarding	Blocking	In RSTP, BPDUs are discarded. In STP, only configuration and management BPDUs are received and processed.
Discarding	Listening	In RSTP, BPDUs are discarded. In STP, all BPDUs are received and processed.
Learning	Learning	All BPDUs are received and processed. Information frames are submitted to the learning process but not forwarded.
Forwarding	Forwarding	All BPDUs are received and processed. All information frames are received and forwarded.

See the IEEE 802.1w standard for more information on RSTP. See the IEEE 802.1D standard for more information on STP.



## 22.2 Spanning Tree Protocol Status Screen

To open this screen, click **Advanced Application**, **Spanning Tree Protocol**.

**Figure 85** Spanning Tree Protocol Status

**Spanning Tree Protocol Status** [STP Config](#)

Spanning Tree Protocol : On

Bridge Status	
Our bridge ID	8000-001349000001
Designated root ID	8000-001349000001
Topology change times	0
Time since change	0:00:04
Cost to root	0
Root port ID	0x0000
Root max age (second)	20
Root hello time (second)	2
Root forward delay (second)	15
Max age (second)	20
Hello time (second)	2
Forward delay (second)	15

Port Status	ENET1	ENET2
State	Disabled	discarding
Port ID	-	0x8032
Path cost	-	4
Cost to root	-	0
Designated bridge	-	0000-000000000000
Designated port	-	0x0000

Poll Interval(s)  Set Interval Stop

The following table describes the labels in this screen.

**Table 50** Spanning Tree Protocol Status

LABEL	DESCRIPTION
STP Config	Click <b>STP Config</b> to modify the IES-612-51's STP settings (see <a href="#">Section 22.3</a> on <a href="#">page 178</a> ).
Spanning Tree Protocol	This field displays <b>On</b> if STP is activated. Otherwise, it displays <b>Off</b> .
Bridge Status	If STP is activated, the following fields appear. If STP is not activated, <b>Disabled</b> appears.
Our bridge ID	This is the unique identifier for this bridge, consisting of bridge priority plus MAC address. This ID is the same in <b>Designated root ID</b> if the IES-612-51 is the root switch.
Designated root ID	This is the unique identifier for the root bridge, consisting of bridge priority plus MAC address. This ID is the same in <b>Our bridge ID</b> if the IES-612-51 is the root switch.
Topology change times	This is the number of times the spanning tree has been reconfigured.
Time since change	This is the time since the spanning tree was last reconfigured.
Cost to root	This is the path cost from the root port on this switch to the root switch.

**Table 50** Spanning Tree Protocol Status (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Root port ID	This is the priority and number of the port on the switch through which this switch must communicate with the root of the Spanning Tree. "0x0000" displays when this device is the root switch.
Root max age (second)	This is the maximum time (in seconds) the root switch can wait without receiving a configuration message before attempting to reconfigure.
Root hello time (second)	This is the time interval (in seconds) at which the root switch transmits a configuration message. The root bridge determines <b>Hello Time</b> , <b>Max Age</b> and <b>Forwarding Delay</b> .
Root forward delay (second)	This is the time (in seconds) the root switch will wait before changing states (that is, listening to learning to forwarding).
Max age (second)	This is the maximum time (in seconds) the IES-612-51 can wait without receiving a configuration message before attempting to reconfigure.
Hello time (second)	This is the time interval (in seconds) at which the IES-612-51 transmits a configuration message. The root bridge determines <b>Hello Time</b> , <b>Max Age</b> and <b>Forwarding Delay</b> .
Forward delay (second)	This is the time (in seconds) the IES-612-51 will wait before changing states (that is, listening to learning to forwarding).
Port Status	This identifies the IES-612-51's ports that support the use of STP. If STP is activated, the following fields appear. If STP is not activated, <b>Disabled</b> appears.
State	This field displays the port's RSTP (or STP) state. With RSTP, the state can be <b>discarding</b> , <b>learning</b> or <b>forwarding</b> . With STP, the state can be <b>disabled</b> , <b>blocking</b> , <b>listening</b> , <b>learning</b> , or <b>forwarding</b> . <b>Disabled</b> appears when RSTP has not been turned on for the individual port or the whole device.
Port ID	This is the priority and number of the port on the switch through which this switch must communicate with the root of the Spanning Tree. "0x0000" displays when this device is the root switch.
Path cost	This is the path cost from this port to the root switch.
Cost to root	This is the path cost from the root port on this switch to the root switch.
Designated bridge	This is the unique identifier for the bridge that has the lowest path cost to reach the root bridge, consisting of bridge priority plus MAC address.
Designated port	This is the port on the designated bridge that has the lowest path cost to reach the root bridge, consisting of bridge priority.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Set Interval</b> .
Stop	Click <b>Stop</b> to halt STP statistic polling.

## 22.3 Spanning Tree Protocol Screen

To open this screen, click **Advanced Application, Spanning Tree Protocol, STP Config**.

**Figure 86** Spanning Tree Protocol

**Spanning Tree Protocol** [STP Status](#)

Active ☐

Bridge Priority  (0-65535)

Hello Time  (1-10) seconds

MAX Age  (6-40) seconds

Forwarding Delay  (4-30) seconds

Port	Active	Priority(0-255)	Path Cost(1-65535)
ENET1	<input type="checkbox"/>	<input type="text" value="128"/>	<input type="text" value="4"/>
ENET2	<input type="checkbox"/>	<input type="text" value="128"/>	<input type="text" value="4"/>

The following table describes the labels in this screen.

**Table 51** Spanning Tree Protocol

LABEL	DESCRIPTION
STP Status	Click <b>STP Status</b> to display the IES-612-51's STP status (see <a href="#">Section 22.2 on page 177</a> ).
Active	<p>Select this check box to turn on RSTP.</p> <p><b>Note:</b> It is recommended that you only use STP when you use the IES-612-51 in standalone mode with a network topology that has loops.</p>
Bridge Priority	<p>Bridge priority is used in determining the root switch, root port and designated port. The switch with the highest priority (lowest numeric value) becomes the STP root switch. If all switches have the same priority, the switch with the lowest MAC address will then become the root switch. The allowed range is 0 to 61440.</p> <p>The lower the numeric value you assign, the higher the priority for this bridge. Bridge Priority determines the root bridge, which in turn determines Hello Time, Max Age and Forwarding Delay.</p>
Hello Time	This is the time interval in seconds between BPDU (Bridge Protocol Data Units) configuration message generations by the root switch. The allowed range is 1 to 10 seconds.
MAX Age	This is the maximum time (in seconds) a switch can wait without receiving a BPDU before attempting to reconfigure. All switch ports (except for designated ports) should receive BPDUs at regular intervals. Any port that ages out STP information (provided in the last BPDU) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the switch ports attached to the network. The allowed range is 6 to 40 seconds.

**Table 51** Spanning Tree Protocol (continued)

LABEL	DESCRIPTION
Forwarding Delay	<p>This is the maximum time (in seconds) a switch will wait before changing states. This delay is required because every switch must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result. The allowed range is 4 to 30 seconds.</p> <p>As a general rule:</p> <p><b>Note:</b> <math>2 * (\text{Forward Delay} - 1) \geq \text{Max Age} \geq 2 * (\text{Hello Time} + 1)</math></p>
Port	This field identifies the Ethernet port.
Active	Select this check box to activate STP on this port.
Priority	<p>Configure the priority for each port here.</p> <p>Priority decides which port should be disabled when more than one port forms a loop in a switch. Ports with a higher priority numeric value are disabled first. The allowed range is between 0 and 255 and default value is 128.</p>
Path Cost	Path cost is the cost of transmitting a frame on to a LAN through that port. It is assigned according to the speed of the bridge. The slower the media, the higher the cost.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.

# Port Authentication

This chapter describes the 802.1x authentication method and RADIUS server connection setup.

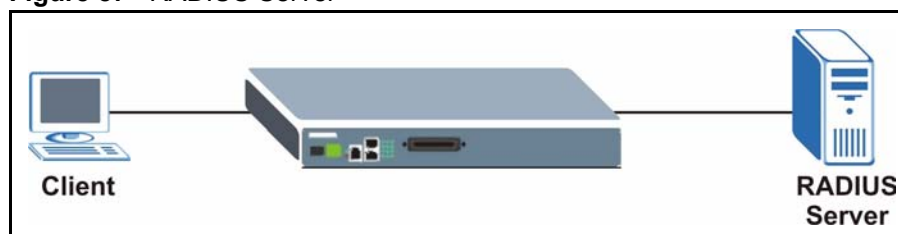
## 23.1 Introduction to Authentication

IEEE 802.1x is an extended authentication protocol<sup>2</sup> that allows support of RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile management on a network RADIUS server.

### 23.1.1 RADIUS

RADIUS (Remote Authentication Dial-In User Service) authentication is a popular protocol used to authenticate users by means of an external server instead of (or in addition to) an internal device user database that is limited to the memory capacity of the device. In essence, RADIUS authentication allows you to validate an unlimited number of users from a central location.

**Figure 87** RADIUS Server



### 23.1.2 Introduction to Local User Database

By storing user profiles locally on the IES-612-51, your IES-612-51 is able to authenticate users without interacting

- 
2. At the time of writing, Windows XP of the Microsoft operating systems supports 802.1x. See the Microsoft web site for information on other Windows operating system support. For other operating systems, see its documentation. If your operating system does not support 802.1x, then you may need to install 802.1x client software.

## 23.2 RADIUS Screen

To open this screen, click **Advanced Application, Port Authentication**.

**Figure 88** RADIUS

The following table describes the labels in this screen.

**Table 52** RADIUS

LABEL	DESCRIPTION
802.1x	Click <b>802.1x</b> to configure individual port authentication settings (see <a href="#">Section 23.3 on page 183</a> ).
Enable Authentication Server	Select this check box to have the IES-612-51 use an external RADIUS server to authenticate users.
IP Address	Enter the IP address of the external RADIUS server in dotted decimal notation.
UDP Port	The default port of the RADIUS server for authentication is <b>1812</b> . You need not change this value unless your network administrator instructs you to do so.
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external RADIUS server and the switch. This key is not sent over the network. This key must be the same on the external RADIUS server and the switch.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Enable Local Profile Setting	Select this check box to have the IES-612-51 use its internal database of user names and passwords to authenticate users.
Name	Type the user name of the user profile.
Password	Type a password up to 31 characters long for this user profile.

**Table 52** RADIUS (continued)

LABEL	DESCRIPTION
Retype Password to confirm	Type the password again to make sure you have entered it properly.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
	This table displays the configured user profiles.
Index	These are the numbers of the user profiles. Click this number to edit the user profile.
Name	This is the user name of the user profile.
Delete	Select a user profile's <b>Delete</b> check box and click <b>Delete</b> to remove the user profile.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh and clear any selected <b>Delete</b> check boxes.

## 23.3 802.1x Screen

To open this screen, click **Advanced Application, Port Authentication, 802.1x**.

**Figure 89** 802.1x

Port	Enable	Control	Reauthentication	Reauthentication Period(s)
1	<input type="checkbox"/>	AUTO	On	3600 (60~65535)
2	<input type="checkbox"/>	AUTO	On	3600 (60~65535)
3	<input type="checkbox"/>	AUTO	On	3600 (60~65535)
4	<input type="checkbox"/>	AUTO	On	3600 (60~65535)
5	<input type="checkbox"/>	AUTO	On	3600 (60~65535)

The following table describes the labels in this screen.

**Table 53** 802.1x

LABEL	DESCRIPTION
RADIUS/Local Profile	Click this link to configure the RADIUS server or local profile settings (see <a href="#">Section 23.2 on page 182</a> ).
Enable	Select this check box to turn on IEEE 802.1x authentication on the switch.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

**Table 53** 802.1x (continued)

LABEL	DESCRIPTION
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
Port	This field displays a port number.
Enable	Select this check box to turn on IEEE 802.1x authentication on this port.
Control	Select <b>AUTO</b> to authenticate all subscribers before they can access the network through this port. Select <b>FORCE AUTHORIZED</b> to allow all connected users to access the network through this port without authentication. Select <b>FORCE UNAUTHORIZED</b> to deny all subscribers access to the network through this port.
Reauthentication	Specify if a subscriber has to periodically re-enter his or her username and password to stay connected to the port.
Reauthentication Period(s)	Specify how often a client has to re-enter his or her username and password to stay connected to the port.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.



# Port Security

This chapter shows you how to set up port security.

## 24.1 Port Security Overview

Port security allows you to restrict the number of MAC addresses that can be learned on a port.

## 24.2 Port Security Screen

To open this screen, click **Advanced Application, Port Security**.

**Figure 90** Port Security

Port	Enable	Limited Number of Learned MAC Address
1	<input type="checkbox"/>	5 (1-128)
2	<input type="checkbox"/>	5 (1-128)
3	<input type="checkbox"/>	5 (1-128)
4	<input type="checkbox"/>	5 (1-128)
5	<input type="checkbox"/>	5 (1-128)

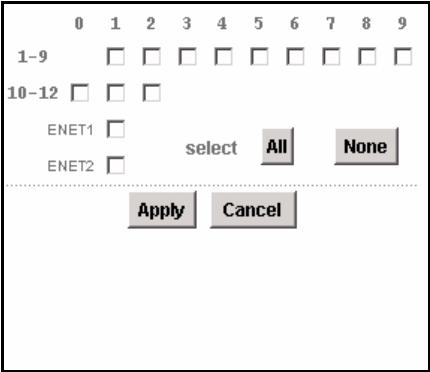
Apply Cancel Copy port 1 Paste

The following table describes the labels in this screen.

**Table 54** Port Security

LABEL	DESCRIPTION
Port	This field displays a port number.
Enable	Select this check box to restrict the number of MAC addresses that can be learned on the port. Clear this check box to not limit the number of MAC addresses that can be learned on the port.
Limited Number of Learned MAC Address	Specify how many MAC addresses the IES-612-51 can learn on this port. The range is 1~128.  Note: If you also use MAC filtering on a port, it is recommended that you set this limit to be equal to or greater than the number of MAC filter entries you configure.

**Table 54** Port Security (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
Copy port Paste	<p>Do the following to copy settings from one port to another port or ports.</p> <ol style="list-style-type: none"><li>1 Select the number of the port from which you want to copy settings.</li><li>2 Click <b>Paste</b> and the following screen appears.</li><li>3 Select to which ports you want to copy the settings. Use <b>All</b> to select every port. Use <b>None</b> to clear all of the check boxes.</li><li>4 Click <b>Apply</b> to paste the settings.</li></ol> <p><b>Figure 91</b> Select Ports</p> 

# DHCP Relay

This chapter shows you how to set up DHCP relays for each VLAN.

## 25.1 DHCP Relay

DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients to obtain TCP/IP configuration at start-up from a DHCP server. You can configure the IES-612-51 to relay DHCP requests to one or more DHCP servers and the server's responses back to the clients. You can specify default DHCP servers for all VLAN, and you can specify DHCP servers for each VLAN.

## 25.2 DHCP Relay Agent Information Option (Option 82)

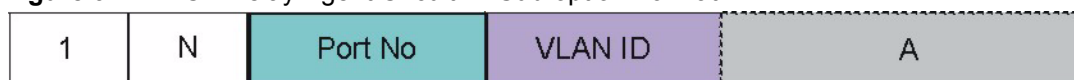
The IES-612-51 can add information to DHCP requests that it relays to a DHCP server. This helps provide authentication about the source of the requests. You can also specify additional information for the IES-612-51 to add to the DHCP requests that it relays to the DHCP server. Please see RFC 3046 for more details.

### 25.2.1 DHCP Relay Agent Circuit ID and Remote ID Sub-option Formats

The DHCP relay agent information feature adds an Agent Information field to the option 82 field of the DHCP headers of DHCP request frames that the IES-612-51 relays to a DHCP server. The Agent Information field that the IES-612-51 adds contains an "Agent Circuit-ID sub-option" that includes the port number, VLAN ID and optional information about the port where the DHCP request was received.

The following figure shows the format of the Agent Circuit ID sub-option. The 1 in the first field identifies this as an Agent Circuit ID sub-option. The length N gives the total number of octets in the Agent Information Field. If the configuration request was received on a DSL port, a 2-byte Port No field specifies the ingress port number (the first byte is always 0, the second byte is in hexadecimal format). The next field is 2 bytes and displays the DHCP request packet's VLAN ID. The last field (A) can range from 0 to 24 bytes and is optional information (that you specify) about this relay agent.

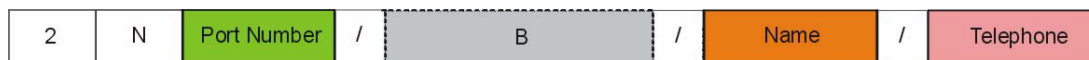
**Figure 92** DHCP Relay Agent Circuit ID Sub-option Format



The Agent Information field that the IES-612-51 adds also contains an “Agent Remote-ID sub-option” of information that you specify.

The following figure shows the format of the Agent Remote ID sub-option. The 2 in the first field identifies this as an Agent Remote ID sub-option. The length N gives the total number of octets in the Agent Information Field. Then there is the number of the port (in plain text format) upon which the DHCP client request was received. The next field (B in the figure) is 0 to 23 bytes of optional information that you specify. This is followed by the name and telephone number configured for the DSL port. The port number, optional information (B in the figure), DSL name and DSL telephone number fields are separated by forward slashes.


**Figure 93** DHCP Relay Agent Remote ID Sub-option Format



## 25.3 DHCP Relay Screen

To open this screen, click **Advanced Application, DHCP Relay**.

**Figure 94** DHCP Relay


**DHCP Relay**

Enable DHCP Relay ☒

Relay Mode Auto ▾

Enable Option82 Sub-option1 ☐

Sub-option1 (Circuit ID)

Enable Option82 Sub-option2 ☐

Sub-option2 (Remote ID)

Apply Cancel

VLAN ID 0 (1~4094, 0: for the default server)

Primary Server IP 0.0.0.0

Secondary Server IP 0.0.0.0

Active Server Primary ▾

Apply Cancel

**Server List** Note: The server with VLAN ID 0 is the default server. (\*): Active server

Index	VLAN ID	Primary Server IP	Secondary Server IP	Select
1	0	(*)172.23.5.2	0.0.0.0	<input type="checkbox"/>

Delete Select All None

The following table describes the labels in this screen.

**Table 55** DHCP Relay

LABEL	DESCRIPTION
Enable DHCP Relay:	Enable DHCP relay to have the IES-612-51 relay DHCP requests to a DHCP server and the server's responses back to the clients.
Relay Mode	Specify how the IES-612-51 relays DHCP requests. <b>Auto</b> - The IES-612-51 routes DHCP requests to the active server for each VLAN. <b>Both</b> - The IES-612-51 routes DHCP requests to the primary and secondary server for each VLAN, regardless of which one is active.
Enable Option82 Sub-option1	Enable DHCP relay info to have the IES-612-51 add the originating port numbers to DHCP requests regardless of whether the DHCP relay is on or off.
Sub-option1 (Circuit ID)	Use this field to specify up to 23 ASCII characters of additional information for the IES-612-51 to add to the DHCP requests that it relays to a DHCP server. Examples of information you could add would be the chassis number of the IES-612-51 or the ISP's name.
Enable Option82 Sub-option2	Enable DHCP relay info to have the IES-612-51 add the sub-option 2 (Remote ID) to DHCP requests regardless of whether the DHCP relay is on or off.
Sub-option2 (Remote ID)	Use this field to specify up to 23 ASCII characters of additional information for the IES-612-51 to add to the DHCP requests that it relays to a DHCP server.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
VLAN ID	Enter the ID of the VLAN served by the specified DHCP relay(s). Enter 0 to set up the IP address(es) of the default DHCP relay(s).
Primary Server IP	Enter the IP address of one DHCP server to which the switch should relay DHCP requests for the selected VLAN.
Secondary Server IP	Enter the IP address of a second DHCP server to which the switch should relay DHCP requests for the selected VLAN. Enter 0.0.0.0 if there is only one DHCP relay for the selected VLAN.
Active Server	This field has no effect if the <b>Relay Mode</b> is <b>Both</b> . If the <b>Relay Mode</b> is <b>Auto</b> , select which DHCP server (the primary one or the secondary one) to which the IES-612-51 should relay DHCP requests for the selected VLAN.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.
Server List	This section lists the DHCP servers that are already set up for each VLAN. An asterisk in parentheses (*) indicates which DHCP server is active for each VLAN.
Index	This is a sequential value, and it is not associated with any entry. The entries are sorted by VLAN ID.
VLAN ID	This field displays the ID of the VLAN served by the specified DHCP relay(s).
Primary Server IP	This field displays the IP address of one DHCP server to which the switch should relay DHCP requests.
Secondary Server IP	This field displays the IP address of a second DHCP server to which the switch should relay DHCP requests. This field is 0.0.0.0 if the primary server is the only DHCP relay.

**Table 55** DHCP Relay (continued)

LABEL	DESCRIPTION
Select Delete	Select the check box in the <b>Select</b> column for an entry, and click <b>Delete</b> to remove the entry.
Select All	Click this to select all entries in the <b>Server List</b> .
Select None	Click this to un-select all entries in the <b>Server List</b> .

# DHCP Snoop

This chapter shows you how to set up DHCP snooping settings on the subscriber ports.

## 26.1 DHCP Snoop Overview

DHCP snooping prevents clients from assigning their own IP addresses. The IES-612-51 can store every (DSL port, MAC address, IP address) tuple offered by the DHCP server. Then, it only forwards packets from clients whose MAC address and IP address are recorded. Packets from unknown IP addresses are dropped.

## 26.2 DHCP Snoop Screen

Use this screen to activate or deactivate DHCP snooping on each port. To open this screen, click **Advanced Application, DHCP Snoop**.

**Figure 95** DHCP Snoop

Port	Active	Select
1	-	<input type="checkbox"/>
2	-	<input type="checkbox"/>
3	-	<input type="checkbox"/>
4	-	<input type="checkbox"/>
5	-	<input type="checkbox"/>

Active Inactive Select All None

The following table describes the labels in this screen.

**Table 56** DHCP Snoop

LABEL	DESCRIPTION
DHCP Snoop Status	Click <b>DHCP Snoop Status</b> to open the screen where you can look at or clear the current DHCP snooping table on each port (see <a href="#">Section 26.3 on page 192</a> ).
DHCP Counter	Click <b>DHCP Counter</b> to open the screen where you can look at a summary of the DHCP packets on each port (see <a href="#">Section 26.4 on page 193</a> ).
Port	This field displays each DSL port number.
Active	This field displays whether DHCP snooping is active ("V") or inactive ("-") on this port.

**Table 56** DHCP Snoop (continued)

LABEL	DESCRIPTION
Select	Select this, and click <b>Active</b> or <b>Inactive</b> to enable or disable the DHCP snooping on this port.
Active	Click this to enable DHCP snooping on the selected ports.
Inactive	Click this to disable DHCP snooping on the selected ports.
All	Click this to select all entries in the table.
None	Click this to un-select all entries in the table.

## 26.3 DHCP Snoop Status Screen

Use this screen to look at or to clear the DHCP snooping table on each port. To open this screen, click **Advanced Application, DHCP Snoop, DHCP Snoop Status**.

**Figure 96** DHCP Snoop Status

DHCP Snoop Status

[DHCP Snoop](#) [DHCP Counter](#)

Show Port: **All**

Port	Overflow	IP	MAC
1	0	-	-
2	0	-	-
3	0	-	-
4	0	-	-
5	0	-	-

**Flush**

The following table describes the labels in this screen.

**Table 57** DHCP Snoop Status

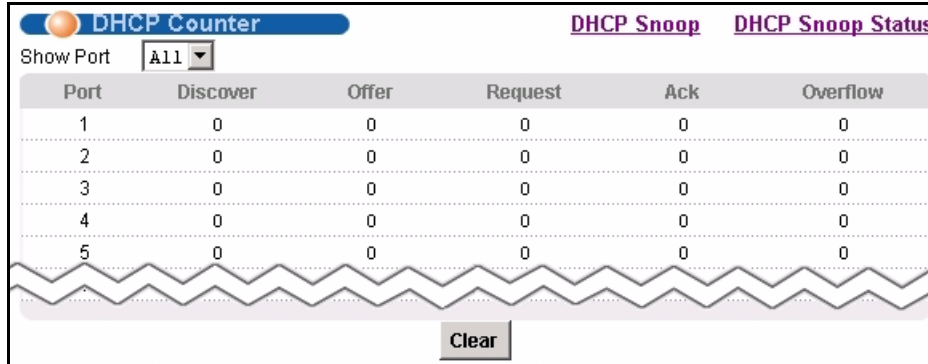
LABEL	DESCRIPTION
DHCP Snoop	Click <b>DHCP Snoop</b> to open the screen where you can activate or deactivate DHCP snooping on each port (see <a href="#">Section 26.2 on page 191</a> ).
DHCP Counter	Click <b>DHCP Counter</b> to open the screen where you can look at a summary of the DHCP packets on each port (see <a href="#">Section 26.4 on page 193</a> ).
Show Port	Select a port for which you wish to view information.
Port	This field displays the selected DSL port number(s).
Overflow	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.
IP	This field displays the IP address assigned to a client on this port.
MAC	This field displays the MAC address of a client on this port to which the DHCP server assigned an IP address.
Flush	Click <b>Flush</b> to remove all of the entries from the DHCP snooping table for the selected port(s).



## 26.4 DHCP Counter Screen

Use this screen to look at a summary of the DHCP packets on each port. To open this screen, click **Advanced Application**, **DHCP Snoop**, **DHCP Counter**.

**Figure 97** DHCP Counter



Port	Discover	Offer	Request	Ack	Overflow
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0

The following table describes the labels in this screen.

**Table 58** DHCP Counter

LABEL	DESCRIPTION
DHCP Snoop	Click <b>DHCP Snoop</b> to open the screen where you can activate or deactivate DHCP snooping on each port (see <a href="#">Section 26.2 on page 191</a> ).
DHCP Snoop Status	Click <b>DHCP Snoop Status</b> to open the screen where you can look at or clear the current DHCP snooping table on each port (see <a href="#">Section 26.3 on page 192</a> ).
Show Port	Select a port for which you wish to view information.
Port	This field displays the selected DSL port number(s).
Discover	This field displays the number of DHCP Discover packets on this port.
Offer	This field displays the number of DHCP Offer packets on this port.
Request	This field displays the number of DHCP Request packets on this port.
Ack	This field displays the number of DHCP Acknowledge packets on this port.
Overflow	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.
Clear	Click <b>Clear</b> to delete the information the IES-612-51 has learned about DHCP packets. This resets every counter in this screen.



# RFC 2684 Routed Mode

This chapter shows you how to set up 2684 routed mode service.

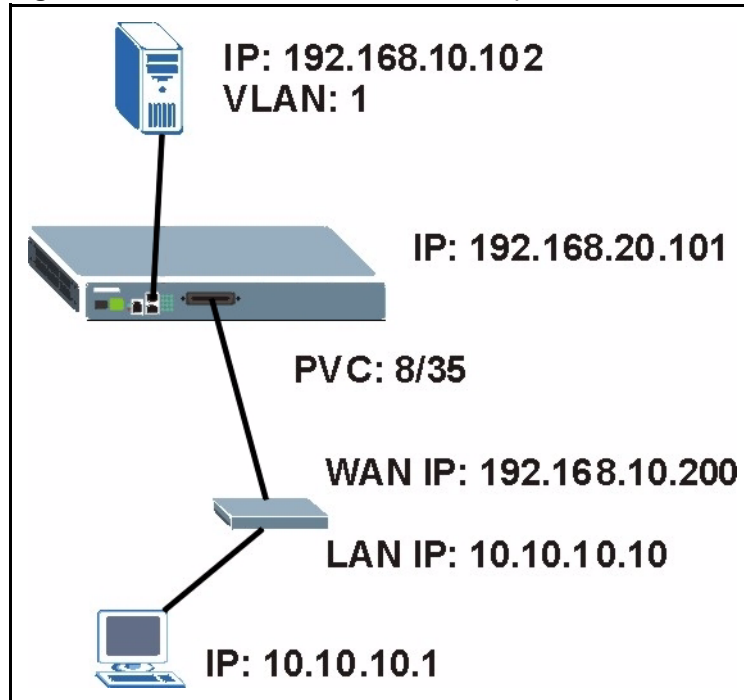
## 27.1 RFC 2684 Routed Mode

Use the RFC 2684 (formerly RFC 1483) routed mode to have the IES-612-51 add MAC address headers to 2684 routed mode traffic from a PVC that connects to a subscriber device that uses 2684 routed mode. You also specify the gateway to which the IES-612-51 sends the traffic and the VLAN ID tag to add. See RFC-2684 for details on routed mode traffic carried over AAL type 5 over ATM.

- Use the [2684 Routed PVC Screen](#) to configure PVCs for 2684 routed mode traffic.
- Use the [2684 Routed Domain Screen](#) to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE or Customer Premises Equipment). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.
- Use the [RPVC Arp Proxy Screen](#) to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.
- Use the [2684 Routed Gateway Screen](#) to configure gateway settings.
- For upstream traffic: Since the subscriber's device will not send out a MAC address, after the IES-612-51 reassembles the Ethernet packets from the AAL5 ATM cells, the IES-612-51 will append the routed mode gateway's MAC address and the IES-612-51's MAC address as the destination/source MAC address.
- For downstream traffic: When the IES-612-51 sees the destination IP address is specified in the RPVC (or RPVC domain), the IES-612-51 will strip out the MAC header and send them to the corresponding RPVC.

### 27.1.1 RFC 2684 Routed Mode Example

The following figure shows an example 2684 routed mode set up. The gateway server uses IP address 192.168.10.102 and is in VLAN 1. The IES-612-51 uses IP address 192.168.20.101. The subscriber's device (the CPE) is connected to DSL port 1 on the IES-612-51 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's WAN IP address is 192.168.10.200. The routed domain is the LAN IP addresses behind the CPE device. The CPE device's LAN IP address is 10.10.10.10 and the LAN computer's IP address is 10.10.10.1. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

**Figure 98** RFC 2684 Routed Mode Example

Note the following.

- The CPE device's WAN IP (192.168.10.200 in this example) must be in the same subnet as the gateway's IP address (192.168.10.102 in this example).
- The IES-612-51's management IP address can be any IP address, it doesn't have any relationship to the WAN IP address or routed gateway IP address.
- The IES-612-51's management IP address should not be in the same subnet as the one defined by the WAN IP address and netmask of the subscriber's device. It is suggested that you set the netmask of the subscriber's WAN IP address to 32 to avoid this problem.
- The IES-612-51's management IP address should not be in the same subnet range of any RPVC and RPVC domain. It will make the IES-612-51 confused if the IES-612-51 receives a packet with this IP as destination IP.
- The IES-612-51's management IP address also should not be in the same subnet as the one defined by the LAN IP address and netmask of the subscriber's device. Make sure you assign the IP addresses properly.
- In general deployment, the computer must set the CPE device's LAN IP address (10.10.10.10 in this example) as its default gateway.
- The subnet range of any RPVC and RPVC domain must be unique.

## 27.2 2684 Routed PVC Screen

Use this screen to configure PVCs for 2684 routed mode traffic.

To open this screen, click **Advanced Application, 2684 Routed Mode**.

**Figure 99** RFC 2684 Routed PVC

2684 Routed PVC

[Routed Domain](#) [RPVC ARP Proxy](#) [Routed Gateway](#)

Port: 1 Gateway IP: 0.0.0.0

VPI: 0 VCI: 0

IP: 0.0.0.0 NetMask: 0 (1-32)

DS VC Profile: DEFVAL

US VC Profile: -

Add Cancel

Index	Port	VPI	VCI	IP	DS / US VC Profile	NetMask	Gateway IP	Delete
Delete Cancel								

The following table describes the labels in this screen.

**Table 59** RFC 2684 Routed PVC

LABEL	DESCRIPTION
Routed Domain	Click <b>Routed Domain</b> to open this screen where you can configure domains for 2684 routed mode traffic (see <a href="#">Section 27.3 on page 198</a> ).
RPVC ARP Proxy	Click <b>RPVC ARP Proxy</b> to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see <a href="#">Section 27.4 on page 199</a> ).
Routed Gateway	Click <b>Routed Gateway</b> to go to the screen where you can configure gateway settings (see <a href="#">Section 27.5 on page 200</a> ).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
Gateway IP	Enter the IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.
VPI	Type the Virtual Path Identifier for this routed PVC.
VCI	Type the Virtual Circuit Identifier for this routed PVC.
IP	Enter the subscriber's CPE WAN IP address in dotted decimal notation.
NetMask	The bit number of the subnet mask of the subscriber's WAN IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24). Make sure that the routed PVC's subnet does not include the IES-612-51's IP address.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.
Index	This field displays the number of the routed PVC.

**Table 59** RFC 2684 Routed PVC (continued)

LABEL	DESCRIPTION
Port	This field displays the number of the DSL port on which the routed PVC is configured.
VPI	This field displays the Virtual Path Identifier (VPI). The VPI and VCI identify a channel on this port.
VCI	This field displays the Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
IP	This field displays the subscriber's IP address.
DS / US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
NetMask	This field displays the bit number of the subnet mask of the subscriber's IP address.
Gateway IP	This field displays the IP address of the gateway to which you want to send the traffic that the system receives from this PVC.
Delete	Select an entry's <b>Delete</b> check box and click <b>Delete</b> to remove the entry. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

## 27.3 2684 Routed Domain Screen

Use this screen to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

To open this screen, click **Advanced Application, 2684 Routed Mode, Routed Domain**.

**Figure 100** 2684 Routed Domain

The screenshot shows the '2684 Routed Domain' configuration interface. At the top, there's a navigation bar with the title '2684 Routed Domain' and three links: 'RPVC ARP Proxy', 'Routed Gateway', and 'Routed PVC'. Below this is a configuration form with the following fields:

- Port:** A dropdown menu currently showing '1'.
- VPI:** A text input field containing '0'.
- VCI:** A text input field containing '0'.
- IP:** A text input field containing '0.0.0.0'.
- NetMask:** A text input field containing '0', with '(1-32)' indicating the valid range.

Below the form are two buttons: 'Add' and 'Cancel'. At the bottom of the screen, there is a table with the following columns: Index, Port, VPI, VCI, IP, NetMask, and Delete. Below the table are two buttons: 'Delete' and 'Cancel'.

The following table describes the labels in this screen.

**Table 60** 2684 Routed Domain

LABEL	DESCRIPTION
RPVC ARP Proxy	Click <b>RPVC ARP Proxy</b> to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see <a href="#">Section 27.4 on page 199</a> ).
Routed Gateway	Click <b>Routed Gateway</b> to go to the screen where you can configure gateway settings (see <a href="#">Section 27.5 on page 200</a> ).
Routed PVC	Click <b>Routed PVC</b> to go to the screen where you can configure routed PVC settings (see <a href="#">Section 27.2 on page 196</a> ).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
VPI	Type the Virtual Path Identifier for this routed PVC.
VCI	Type the Virtual Circuit Identifier for this routed PVC.
IP	Enter the subscriber's CPE LAN IP address in dotted decimal notation.
NetMask	The bit number of the subnet mask of the subscriber's IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.
Index	This field displays the number of the routed PVC.
Port	This field displays the number of the DSL port on which the routed PVC is configured.
VPI	This field displays the Virtual Path Identifier (VPI). The VPI and VCI identify a channel on this port.
VCI	This field displays the Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
IP	This field displays the subscriber's IP address.
NetMask	This field displays the bit number of the subnet mask of the subscriber's LAN IP address.
Delete	Select an entry's <b>Delete</b> check box and click <b>Delete</b> to remove the entry. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

## 27.4 RPVC Arp Proxy Screen

Use this screen to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.

To open this screen, click **Advanced Application, 2684 Routed Mode, RPVC ARP Proxy**.

**Figure 101** RPVC Arp Proxy

The following table describes the labels in this screen.

**Table 61** RPVC Arp Proxy

LABEL	DESCRIPTION
Routed Domain	Click <b>Routed Domain</b> to open this screen where you can configure domains for 2684 routed mode traffic (see <a href="#">Section 27.3 on page 198</a> ).
Routed Gateway	Click <b>Routed Gateway</b> to go to the screen where you can configure gateway settings (see <a href="#">Section 27.5 on page 200</a> ).
Routed PVC	Click <b>Routed PVC</b> to go to the screen where you can configure routed PVC settings (see <a href="#">Section 27.2 on page 196</a> ).
Aging Time	Enter a number of seconds (10~10000) to set how long the device keeps the Address Resolution Protocol table's entries of IP addresses of CPE devices using 2684 routed mode. Enter 0 to disable the aging time.
Apply Setting	Click <b>Apply Setting</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the IP address entry.
Gateway IP	This field displays the IP address of the gateway to which the device sends the traffic that it receives from this entry's IP address.
VID	This field displays the VLAN Identifier that the device adds to Ethernet frames that it sends to this gateway.
MAC	This field displays the subscriber's MAC (Media Access Control) address.
Flush	Click <b>Flush</b> to remove all of the entries from the ARP table.

## 27.5 2684 Routed Gateway Screen

Use this screen to configure gateway settings.

To open this screen, click **Advanced Application, 2684 Routed Mode, Routed Gateway**.



**Figure 102** 2684 Routed Gateway

**2684 Routed Gateway**      **Routed PVC**      **Routed Domain**      **RPVC ARP Proxy**

Gateway IP:

VID:  (1~4094)

Priority:  (0~7, default: 0)

**Add**

Index	Gateway IP	VID	Priority	Delete
<b>Delete</b> <b>Cancel</b>				

The following table describes the labels in this screen.

**Table 62** 2684 Routed Gateway

LABEL	DESCRIPTION
Routed PVC	Click <b>Routed PVC</b> to go to the screen where you can configure routed PVC settings (see <a href="#">Section 27.2 on page 196</a> ).
Routed Domain	Click <b>Routed Domain</b> to open this screen where you can configure domains for 2684 routed mode traffic (see <a href="#">Section 27.3 on page 198</a> ).
RPVC ARP Proxy	Click <b>RPVC ARP Proxy</b> to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see <a href="#">Section 27.4 on page 199</a> ).
Gateway IP	Enter the IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.
VID	Specify a VLAN Identifier to add to Ethernet frames that the system routes to this gateway.
Priority	Select the IEEE 802.1p priority (0~7) to add to the traffic that you send to this gateway.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the gateway entry.
Gateway IP	This field displays the IP address of the gateway.
VID	This field displays the VLAN Identifier that the system adds to Ethernet frames that it sends to this gateway.
Priority	This field displays the IEEE 802.1p priority (0~7) that is added to traffic sent to this gateway.
Delete	Select an entry's <b>Delete</b> check box and click <b>Delete</b> to remove the entry. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.



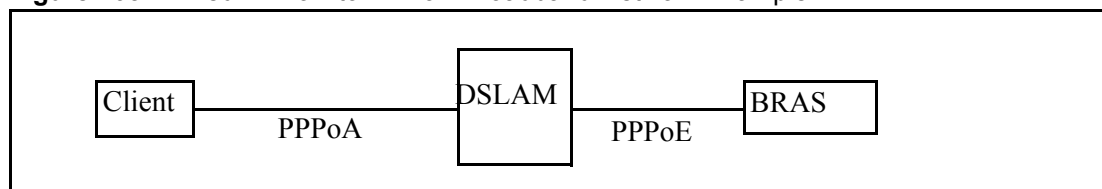
# PPPoA to PPPoE

This chapter shows you how to set up the IES-612-51 to convert PPPoA frames to PPPoE traffic and vice versa.

## 28.1 PPPoA to PPPoE Overview

Before migrating to an Ethernet infrastructure, a broadband network might consist of PPPoA connections between the CPE devices and the DSLAM and PPPoE connections from the DSLAM to the Broadband Remote Access Server (BRAS). The following figure shows a network example.

**Figure 103** Mixed PPPoA-to-PPPoE Broadband Network Example



In order to allow communication between the end points (the CPE devices and the BRAS), you need to configure the DSLAM (the IES-612-51) to translate PPPoA frames to PPPoE packets and vice versa.

When PPPoA packets are received from the CPE, the ATM headers are removed and the IES-612-51 adds PPPoE and Ethernet headers before sending the packets to the BRAS. When the IES-612-51 receives PPPoE packets from the BRAS, PPPoE and Ethernet headers are stripped and necessary PVC information (such as encapsulation type) is added before forwarding to the designated CPE.

## 28.2 PPPoA to PPPoE Screen

Use this screen to set up PPPoA to PPPoE conversions on each port. This conversion is set up by creating a PAE PVC. See [Chapter 13 on page 107](#) for background information about creating PVCs. To open this screen, click **Advanced Application, PPPoA to PPPoE**.

**Figure 104** PPPoA to PPPoE

The following table describes the labels in this screen.

**Table 63** PPPoA to PPPoE

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to set up PPPoA to PPPoE conversions. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	<p>Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.</p> <p><b>Note:</b> Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.</p>
PVID	<p>Type a PVID (Port VLAN ID) to assign to untagged frames received on this channel.</p> <p><b>Note:</b> Make sure the VID is not already used for multicast VLAN or TLS PVC.</p>
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.

**Table 63** PPPoA to PPPoE (continued)

LABEL	DESCRIPTION
AC Name	This field is optional. Specify the hostname of a remote access concentrator if there are two access concentrators (or BRAS) on the network or if you want to allow PAE translation to the specified access concentrator. In this case, the IES-612-51 checks the AC name field in the BRAS's reply PDU. If there is a mismatch, the IES-612-51 drops this PDU. (This is not recorded as an <b>PPPoE AC System Error</b> in the <b>PPPoA to PPPoE Status</b> screen, however.)
Service Name	This field is optional. Specify the name of the service that uses this PVC. This must be a service name that you configure on the remote access concentrator.
Hellotime	Specify the timeout, in seconds, for the PPPoE session. Enter 0 if there is no timeout.
Apply	Click this to add or save channel settings on the selected port. This saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.
Show Port	Select which DSL port(s) for which to display PPPoA to PPPoE conversion settings.
Index	This field displays the number of the PVC. Click a PVC's index number to open the screen where you can look at the current status of this PPPoA-to-PPPoE conversion. (See <a href="#">Section 28.3 on page 206</a> .)  <b>Note:</b> At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then, delete any unwanted PVCs.
Port	This field displays the number of the DSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
Hellotime	This field displays the timeout for the PPPoE session, in seconds.
DS / US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Access Concentrator Name	This field displays the name of the specified remote access concentrator, if any.
Service Name	This field displays the name of the service that uses this PVC on the remote access concentrator.
Select Delete	Select the check box in the <b>Select</b> column for an entry, and click <b>Delete</b> to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

## 28.3 PPPoA to PPPoE Status Screen

Use this screen to look at the current status of each PPPoA to PPPoE conversion. To open this screen, click **Advanced Application, PPPoA to PPPoE**, and then click an index number.

**Figure 105** PPPoA to PPPoE Status

**PPPoA to PPPoE Status** [PPPoA to PPPoE](#)

PVC 1-0/33

**Session Status**

Session State	Down
Session ID	0
Session Uptime	0secs
AC Name	
Service Name	

**Counter Status**

	Tx	Rx
PPP LCP Config-Request	-	0
PPP LCP Echo-Request	-	0
PPP LCP Echo-Reply	-	0
PPPoE PADI	0	-
PPPoE PADO	-	0
PPPoE PADR	0	-
PPPoE PADS	-	0
PPPoE PADT	0	0
PPPoE Service Name Error	-	0
PPPoE AC System Error	-	0
PPPoE Generic Error	0	0

The following table describes the labels in this screen.

**Table 64** PPPoA to PPPoE Status

LABEL	DESCRIPTION
PPPoA to PPPoE	Click <b>PPPoA to PPPoE</b> to open the screen where you can set up PPPoA-to-PPPoE conversions on each port (see <a href="#">Section 28.2 on page 203</a> ).
PVC	This field displays the port number, VPI, and VCI of the PVC.
Session Status	
Session State	This field displays whether or not the current session is <b>Up</b> or <b>Down</b> .
Session ID	This field displays the ID of the current session. It displays <b>0</b> if there is no current session.
Session Uptime	This field displays how long the current session has been up.
AC Name	This field displays the hostname of the remote access concentrator if there are two access concentrators (or BRAS) on the network or if you want to allow PAE translation to the specified access concentrator.

**Table 64** PPPoA to PPPoE Status (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
Service Name	This field specifies the name of the service that uses this PVC.
Counter Status	
Tx/Rx	The values in these columns are for packets transmitted (tx) or received (rx) by the IES-612-51.
PPP LCP Config-Request	This field displays the number of config-request PDUs received by the IES-612-51 from the CPE (client) device.
PPP LCP Echo-Request	This field displays the number of echo-request PDUs received by the IES-612-51 from the CPE (client) device.
PPP LCP Echo-Reply	This field displays the number of echo-reply PDUs received by the IES-612-51 from the CPE (client) device.
PPPoE PADI	This field displays the number of padi PDUs sent by the IES-612-51 to the BRAS.
PPPoE PADO	This field displays the number of pado PDUs sent by the BRAS to the IES-612-51.
PPPoE PADR	This field displays the number of padr PDUs sent by the IES-612-51 to the BRAS.
PPPoE PADS	This field displays the number of pads PDUs sent by the BRAS to the IES-612-51.
PPPoE PADT	This field displays the number of padt PDUs sent and received by the IES-612-51.
PPPoE Service Name Error	This field displays the number of service name errors; for example, the IES-612-51's specified service is different than the BRAS's setting.
PPPoE AC System Error	This field displays the number of times the access concentrator experienced an error while performing the Host request; for example, when resources are exhausted in the access concentrator. This value does not include the number of times the IES-612-51 checks the AC name field in the BRAS's reply PDU and finds a mismatch, however.
PPPoE Generic Error	This field displays the number of other types of errors that occur in the PPPoE session between the IES-612-51 and the BRAS.





This chapter shows you how to set up DSCP on each port and how to convert DSCP values to IEEE 802.1p values.

## 29.1 DSCP Overview

DiffServ Code Point (DSCP) is a field used for packet classification on DiffServ networks. The higher the value, the higher the priority. Lower-priority packets may be dropped if the total traffic exceeds the capacity of the network.

## 29.2 DSCP Setup Screen

Use this screen to activate or deactivate DSCP on each port. To open this screen, click **Advanced Application, DSCP**.

**Figure 106** DSCP Setup

Port	Active	Select
1	-	<input type="checkbox"/>
2	-	<input type="checkbox"/>
3	-	<input type="checkbox"/>
4	-	<input type="checkbox"/>
5	-	<input type="checkbox"/>
ENET1	-	<input type="checkbox"/>
ENET2	-	<input type="checkbox"/>

Active Inactive Select All None

The following table describes the labels in this screen.

**Table 65** DSCP Setup

LABEL	DESCRIPTION
DSCP Map	Click <b>DSCP Map</b> to open the screen where you can set up the mapping between source DSCP priority and IEEE 802.1p priority (see <a href="#">Section 29.3 on page 210</a> ).
Port	This field displays each port number.
Active	This field displays whether DSCP is active ("V") or inactive ("-") on this port.

**Table 65** DSCP Setup (continued)

LABEL	DESCRIPTION
Select	Select this, and click <b>Active</b> or <b>Inactive</b> to enable or disable the DSCP on this port.
Active	Click this to enable DSCP on the selected ports.
Inactive	Click this to disable DSCP on the selected ports.
All	Click this to select all entries in the table.
None	Click this to un-select all entries in the table.

## 29.3 DSCP Map Screen

Use this screen to convert DSCP priority to IEEE 802.1p priority. To open this screen, click **Advanced Application, DSCP, DSCP Map**.

**Figure 107** DSCP Map

Source DSCP	802.1P Priority
0	<input type="text" value="0"/> (0-7)
1	<input type="text" value="0"/> (0-7)
2	<input type="text" value="0"/> (0-7)
3	<input type="text" value="0"/> (0-7)
61	<input type="text" value="7"/> (0-7)
62	<input type="text" value="7"/> (0-7)
63	<input type="text" value="7"/> (0-7)

**Apply**

The following table describes the labels in this screen.

**Table 66** DSCP Map

LABEL	DESCRIPTION
DSCP Map	Click <b>DSCP Setup</b> to open the screen where you can activate or deactivate DSCP on each port (see <a href="#">Section 29.2 on page 209</a> ).
Source DSCP	This field displays each DSCP value.
802.1P Priority	Enter the IEEE 802.1p priority to which you would like to map this DSCP value.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

## TLS PVC

This chapter shows you how to set up Transparent LAN Service (VLAN stacking, Q-in-Q) on each port.

### 30.1 Transparent LAN Service (TLS) Overview

Transparent LAN Service (also known as VLAN stacking or Q-in-Q) allows a service provider to distinguish multiple customers VLANs, even those with the same (customer-assigned) VLAN ID, within its network.

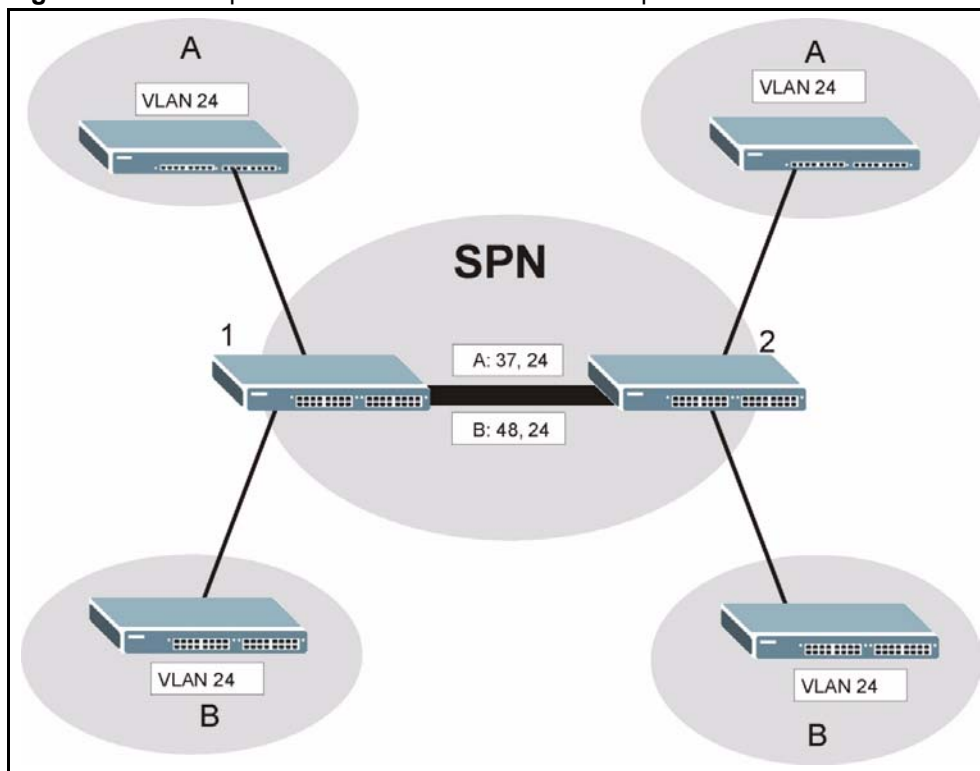
Use TLS to add an outer VLAN tag to the inner IEEE 802.1Q tagged frames that enter the network. By tagging the tagged frames (“double-tagged” frames), the service provider can manage up to 4,094 VLAN groups with each group containing up to 4,094 customer VLANs. This allows a service provider to provide different services, based on specific VLANs, for many different customers.

A service provider’s customers may require a range of VLANs to handle multiple applications. A service provider’s customers can assign their own inner VLAN tags to traffic. The service provider can assign an outer VLAN tag for each customer. Therefore, there is no VLAN tag overlap among customers, so traffic from different customers is kept separate.

Before the IES-612-51 sends the frames from the customers, the VLAN ID is added to the frames. When packets intended for specific customers are received on the IES-612-51, the outer VLAN tag is removed before the traffic is sent.

#### 30.1.1 TLS Network Example

In the following example figure, both A and B are Service Provider’s Network (SPN) customers with VPN tunnels between their head offices and branch offices, respectively. Both have an identical VLAN tag for their VLAN group. The service provider can separate these two VLANs within its network by adding tag 37 to distinguish customer A and tag 48 to distinguish customer B at edge device 1 and then stripping those tags at edge device 2 as the data frames leave the network.

**Figure 108** Transparent LAN Service Network Example

## 30.2 TLS PVC Screen

Use this screen to set up Transparent LAN Services on each port. This is set up by creating a TLS PVC. See [Chapter 13 on page 107](#) for background information about creating PVCs. To open this screen, click **Advanced Application, TLS PVC**.



You can NOT configure PPPoA-to-PPPoE and TLS settings on the same PVC.

**Figure 109** TLS PVC

The screenshot shows the 'TLS PVC' configuration interface. It includes a header bar with the title 'TLS PVC' and an orange icon. Below the header, there are several input fields and dropdown menus for configuring a TLS PVC. The fields are: Port (set to 1), VPI (set to 0), VCI (set to 0), DS VC Profile (set to DEFVAL), US VC Profile (set to -), and VID (set to 1, with a range of 1~4094). There is also a Priority field set to 0. Below these fields are 'Apply' and 'Cancel' buttons. At the bottom of the screen, there is a 'Show Port' dropdown menu set to 'All'. Below this is a table header with columns: Index, Port, VPI/VCI, VID, Priority, DS/US VC Profile, and Select. Below the header are buttons for 'Delete', 'Select', 'All', and 'None'.

The following table describes the labels in this screen.

**Table 67** TLS PVC

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to set up a TLS PVC. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.  Note: Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.
VID	Type a VLAN ID to assign to frames received on this channel.  Note: Make sure the VID is not already used for PPPoA-to-PPPoE conversions.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Apply	Click this to add or save channel settings on the selected port. This saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

**Table 67** TLS PVC (continued)

LABEL	DESCRIPTION
Show Port	Select which DSL port(s) for which to display TLS PVC settings.
Index	<p>This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC.</p> <p><b>Note:</b> At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.</p>
Port	This field displays the number of the DSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
VID	This is the VLAN ID assigned to frames received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
DS/US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Select Delete	Select the check box in the <b>Select</b> column for an entry, and click <b>Delete</b> to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

This chapter shows you how to set up ACL profiles on each port.

## 31.1 Access Control Logic (ACL) Overview

An ACL (Access Control Logic) profile allows the IES-612-51 to classify and perform actions on the upstream traffic. Each ACL profile consists of a rule and an action, and you assign ACL profiles to PVCs.

### 31.1.1 ACL Profile Rules

Each ACL profile uses one of 14 rules to classify upstream traffic. These rules are listed below by rule number.

- 1** etype <etype> vlan <vid>
- 2** etype <etype> smac <mac>
- 3** etype <etype> dmac <mac>
- 4** vlan <vid> smac <mac>
- 5** vlan <vid> dmac <mac>
- 6** smac <mac> dmac <mac>
- 7** vlan <vid> priority <priority>
- 8** etype <etype>
- 9** vlan <vid>
- 10** smac <mac>
- 11** dmac <mac>
- 12** priority <priority>
- 13** protocol <protocol>
- 14** {srcip <ip>/<mask> {dstip <ip>/<mask> {tos <stos> <etos> {srcport <sport> <eport> {dstport <sport> <eport>}}}}}

The input values for these values have the following ranges.

- <vid>: 1~4094
- <priority>: 1~7
- <etype>: 0~65535
- <protocol>: tcp|udp|ospf|igmp|ip|gre|icmp|<ptype>
- <ptype>: 0~255
- <mask>: 0~32

- <tos>: 0~255
- <port>: 0~65535

If you apply multiple profiles to a PVC, the IES-612-51 checks the profiles by rule number. The lower the rule number, the higher the priority the rule (and profile) has. For example, there are two ACL profiles assigned to a PVC. Profile1 is for VLAN ID 100 (rule number 9) traffic, and Profile2 is for IEEE 802.1p priority 0 traffic (rule number 12). The IES-612-51 checks Profile1 first. If the traffic is VLAN ID 100, the IES-612-51 follows the action in Profile1 and does not check Profile2. You cannot assign profiles that have the same rule numbers to the same PVC.

### 31.1.2 ACL Profile Actions

The IES-612-51 can perform the following actions after it classifies upstream traffic.

- rate <rate>: change the rate to the specified value (1~65535 kbps)
- rvlan <rvlan>: change the VLAN ID to the specified value (1~4094)
- rpri <rpri>: change the IEEE 802.1p priority to the specified value (0~7)
- deny: do not forward the packet

The IES-612-51 can apply more than one action to a packet, unless you select deny.

If you select the rvlan action, the IES-612-51 replaces the VLAN ID before it compares the VLAN ID of the packet to the VID of the PVC. As a result, it is suggested that you replace VLAN ID on super channels, not normal PVC, since super channels accept any tagged traffic. If you replace the VLAN ID for a normal PVC, the IES-612-51 drops the traffic because the new VLAN ID does not match the VID of the PVC. This is illustrated in the following scenario.

There is a normal PVC, and its PVID is 900. You create an ACL rule to replace the VLAN ID with 901. Initially, the traffic for the PVC belongs to VLAN 900. Then, the IES-612-51 checks the ACL rule and changes the traffic to VLAN 901. When the IES-612-51 finally compares the VLAN ID of the traffic (901) to the VID of the PVC (900), the IES-612-51 drops the packets because they do not match.

## 31.2 ACL Setup Screen

Use this screen to assign ACL profiles to each PVC. To open this screen, click **Advanced Application, ACL**.



**Figure 110** ACL Setup

The screenshot shows the 'ACL Setup' interface. At the top, there's a navigation bar with 'ACL Setup' and links to 'ACL Profile Setup' and 'ACL Profile Map'. The main area contains a form with four fields: 'Port' (a dropdown menu showing '1'), 'VPI' (a text input field with '0'), 'VCI' (a text input field with '0'), and 'ACL Profile' (a dropdown menu). Below these fields are 'Apply' and 'Cancel' buttons. Further down, there's a 'Show Port' dropdown menu set to 'All'. At the bottom, there's a table with columns: 'Index', 'Port', 'VPI / VCI', 'ACL Profile', and 'Select'. Below the table are 'Delete', 'Select', 'All', and 'None' buttons.

The following table describes the labels in this screen.

**Table 68** ACL Setup

LABEL	DESCRIPTION
ACL Profile Setup	Click <b>ACL Profile Setup</b> to open the screen where you can set up ACL profiles (see <a href="#">Section 31.3 on page 218</a> ).
ACL Profile Map	Click <b>ACL Profile Map</b> to open the screen where you can look at which ACL profiles are assigned to which PVCs (see <a href="#">Section 31.4 on page 219</a> ).
Port	Use this drop-down list box to select a port to which you wish to assign an ACL profile. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
ACL Profile	Use the drop-down list box to select the ACL profile you want to assign to this PVC.
Apply	Click this to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.
Show Port	Select which DSL port(s) for which to display ACL profile settings.
Index	This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC.  <b>Note:</b> At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.
Port	This field displays the number of the DSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
ACL Profile	This field shows the ACL profile assigned to this PVC.
Select Delete	Select the check box in the <b>Select</b> column for an entry, and click <b>Delete</b> to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

## 31.3 ACL Profile Setup Screen

Use this screen to set up ACL profiles. To open this screen, click **Advanced Application**, **ACL**, **ACL Profile Setup**.

**Figure 111** ACL Profile Setup

**ACL Profile Setup** [ACL Setup](#) [ACL Profile Map](#)

Profile Name

---

**Rule**

☐ 1. ethernet type  (0~65535) vlan  (1~4094)  
☐ 2. ethernet type  (0~65535) source mac   
☐ 3. ethernet type  (0~65535) dest mac   
☐ 4. vlan  (1~4094) source mac   
☐ 5. vlan  (1~4094) dest mac   
☐ 6. source mac  dest mac   
☐ 7. vlan  (1~4094) priority   
☐ 8. ethernet type  (0~65535)  
☐ 9. vlan  (1~4094)  
☐ 10. source mac   
☐ 11. dest mac   
☐ 12. priority   
☐ 13. protocol  or protocol type  (0~255)  
☐ 14.

☐ source ip  mask   
☐ dest ip  mask   
☐ tos: start tos  (0~255) end tos  (0~255)  
☐ source port: start port  (0~65535) end port  (0~65535)  
☐ dest port: start port  (0~65535) end port  (0~65535)

---

**Action**

☐ rate  (1~65535)Kbps  
☐ replaced vlan  (1~4094)  
☐ replaced priority   
☐ deny

**Apply** **Cancel**

---

**ACL Profile List**

Index	ACL Profile	Select
<b>Delete</b> <span style="float: right;"> <b>Select</b> <b>All</b> <b>None</b> </span>		

The following table describes the labels in this screen.

**Table 69** ACL Profile Setup

LABEL	DESCRIPTION
ACL Setup	Click <b>ACL Setup</b> to open the screen where you can assign ACL profiles to PVCs (see <a href="#">Section 31.2 on page 216</a> ).
ACL Profile Map	Click <b>ACL Profile Map</b> to open the screen where you can look at which ACL profiles are assigned to which PVCs (see <a href="#">Section 31.4 on page 219</a> ).

**Table 69** ACL Profile Setup (continued)

LABEL	DESCRIPTION
Profile Name	Enter a descriptive name for the ACL profile. The name can be 1-31 printable ASCII characters long. Spaces are not allowed.
Rule	<p>Select which type of rule to use.</p> <p><b>Note:</b> The lower the number (1-14), the higher the priority the rule has.</p> <p>Provide additional information required for the selected rule. Additional rules consist of one or more of the following criteria.</p>
ethernet type	Enter the 16-bit EtherType value between 0 and 65535.
vlan	Enter a VLAN ID between 1 and 4094.
source mac	Enter the source MAC address.
dest mac	Enter the destination MAC address.
priority	Select the IEEE 802.1p priority.
protocol	Select the IP protocol used.
protocol type	Enter the IP protocol number (between 0 and 255) used.
source ip	Enter the source IP address and subnet mask in dotted decimal notation.
dest ip	Enter the source IP address and subnet mask in dotted decimal notation.
tos	Enter the start and end Type of Service between 0 and 255.
source port	Enter the source port or range of source ports.
dest port	Enter the destination port or range of destination ports.
Action	Select which action(s) the IES-612-51 should follow when the criteria are satisfied.
rate	Enter the maximum bandwidth this traffic is allowed to have.
replaced vlan	Enter the VLAN ID that this traffic should use.
replaced priority	Select the IEEE 802.1p priority that this traffic should have.
deny	Select this if you want the IES-612-51 to reject this kind of traffic.
ACL Profile List	
Index	This field displays a sequential value. The sequence in this table is not important. Click this to edit the associated ACL profile in the section above.
ACL Profile	This field displays the name of this ACL profile.
Select Delete	Select the check box in the <b>Select</b> column for an entry, and click <b>Delete</b> to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

## 31.4 ACL Profile Map Screen

Use this screen to look at all the ACL profiles and the PVCs to which each one is assigned. To open this screen, click **Advanced Application, ACL, ACL Profile Map**.

**Figure 112** ACL Profile Map

Index	Profile	Port	VPI/VCID
1	example	1	0 / 33

The following table describes the labels in this screen.

**Table 70** ACL Profile Map

LABEL	DESCRIPTION
ACL Setup	Click <b>ACL Setup</b> to open the screen where you can assign ACL profiles to PVCs (see <a href="#">Section 31.2 on page 216</a> ).
ACL Profile Setup	Click <b>ACL Profile Setup</b> to open the screen where you can set up ACL profiles (see <a href="#">Section 31.3 on page 218</a> ).
ACL Profile	Select the ACL profile(s) for which you want to see which PVCs are assigned to it.
Index	This field displays the number of an entry.
Profile	This field shows the ACL profile assigned to this PVC.
Port	This field displays the DSL port number on which the PVC is configured.
VPI/VCID	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.

# Downstream Broadcast

This chapter shows you how to allow or block downstream broadcast traffic.

## 32.1 Downstream Broadcast

Downstream broadcast allows you to block downstream broadcast packets from being sent to specified VLANs on specified ports.

## 32.2 Downstream Broadcast Screen

To open this screen, click **Advanced Application, Downstream Broadcast**.

**Figure 113** Downstream Broadcast

The following table describes the labels in this screen.

**Table 71** Downstream Broadcast

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to configure settings.
VLAN	Specify the number of a VLAN (on this entry's port) to which you do not want to send broadcast traffic. The VLAN must already be configured in the system.
Add	Click <b>Add</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Blocking Table	
Port	Use this drop-down list box to select a port for which you wish to display settings.

**Table 71** Downstream Broadcast (continued)

LABEL	DESCRIPTION
Index	This field displays the number of the downstream broadcast blocking entry.
Port	This is the number of a DSL port through which you will block downstream broadcast traffic (on a specific VLAN).
VLAN	This field displays the number of a VLAN to which you do not want to send broadcast traffic (on the entry's port).
Select	Select an entry's <b>Select</b> check box and click <b>Delete</b> to remove the entry. Clicking <b>Delete</b> saves your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Select All	Click <b>All</b> to mark all of the check boxes.
Select None	Click <b>None</b> to un-mark all of the check boxes.

# Syslog

This chapter explains how to set the syslog parameters.

## 33.1 Syslog

The syslog feature sends logs to an external syslog server.

## 33.2 SysLog Screen

To open this screen, click **Advanced Application, SysLog**.

**Figure 114** SysLog

The following table describes the labels in this screen.

**Table 72** SysLog

LABEL	DESCRIPTION
Enable Unix Syslog	Select this check box to activate syslog (system logging) and then configure the syslog parameters described in the following fields.
Syslog Server IP	Enter the IP address of the syslog server. (The log facility is specified in <b>Alarm &gt; Alarm Event Setup</b> . See <a href="#">Section 40.4 on page 251</a> .)
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.





## Access Control

This chapter describes how to configure access control.

### 34.1 Access Control Screen

Use this screen to configure SNMP and enable/disable remote service access.

To open this screen, click **Advanced Application, Access Control**.

**Figure 115** Access Control



### 34.2 Access Control Overview

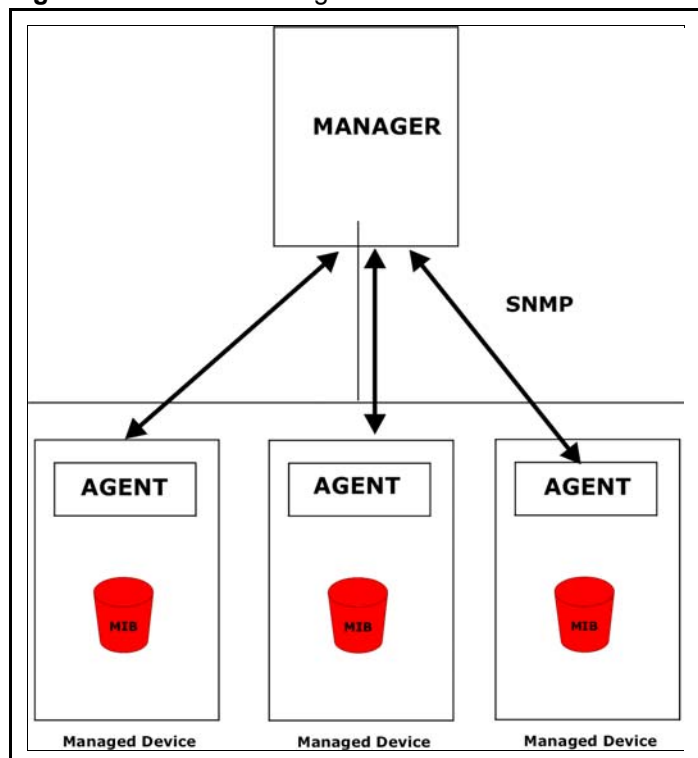
A console port or Telnet session can coexist with one FTP session, a web configurator session and/or limitless SNMP access control sessions.

**Table 73** Access Control Summary

	CONSOLE PORT	TELNET	FTP	WEB	SNMP
Number of sessions allowed	1	5	1	No limit	No limit

### 34.3 SNMP

Simple Network Management Protocol is a protocol used for exchanging management information between network devices. SNMP is a member of TCP/IP protocol suite. A manager station can manage and monitor the IES-612-51 through the network via SNMP version one (SNMPv1) and/or SNMP version 2c. The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

**Figure 116** SNMP Management Model

An SNMP managed network consists of two main components: agents and a manager.

An agent is a management software module that resides in a managed device (the IES-612-51). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.

The managed devices contain object variables/managed objects that define each piece of information to be collected about a device. Examples of variables include such as number of packets received, node port status etc. A Management Information Base (MIB) is a collection of managed objects. SNMP allows a manager and agents to communicate for the purpose of accessing these objects.

SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

**Table 74** SNMP Commands

COMMAND	DESCRIPTION
Get	Allows the manager to retrieve an object variable from the agent.
GetNext	Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
Set	Allows the manager to set values for object variables within an agent.
Trap	Used by the agent to inform the manager of some events.

### 34.3.1 Supported MIBs

MIBs let administrators collect statistics and monitor status and performance. See [Appendix on page 385](#) for the list of MIBs the IES-612-51 supports.

### 34.3.2 SNMP Traps

The IES-612-51 can send the following SNMP traps to an SNMP manager when an event occurs. ATUC refers to the downstream channel (for traffic going from the IES-612-51 to the subscriber). ATUR refers to the upstream channel (for traffic coming from the subscriber to the IES-612-51).

**Table 75** SNMPv2 Traps

TRAP NAME	DESCRIPTION
coldStart	This trap is sent when the IES-612-51 is turned on.
warmStart	This trap is sent when the IES-612-51 restarts.
linkDown	This trap is sent when the Ethernet link is down. Enterprise specific (adsl_atuc_los) traps are sent when an ADSL link is down.
linkUp	This trap is sent when the Ethernet or ADSL link comes up.
authenticationFailure	This trap is sent when the SNMP community check fails.
reboot	This trap is sent when the system is going to reboot. The variable is the reason for the system reboot.
overheat	This trap is sent when the system is overheated. The variable is the current system temperature in Celsius.
overheatOver	This trap is sent when the system is no longer overheated. The variable is the current system temperature in Celsius.
voltageOutOfRange	This trap is sent when the voltage of the system is out of the normal range. The variable is the current voltage of the system in volts.
voltageNormal	This trap is sent when the voltage of the system is back within the normal range. The variable is the current voltage of the system in volts.
thermalSensorFailure	This trap is sent when the thermal sensor fails.
adslAtucLof	This trap is sent when a Loss Of Frame is detected on the ATUC.
adslAturLof	This trap is sent when a Loss Of Frame is detected on the ATUR.
adslAtucLos	This trap is sent when a Loss Of Signal is detected on the ATUC.
adslAturLos	This trap is sent when a Loss Of Signal is detected on the ATUR.
adslAturLpr	This trap is sent when a Loss Of Power is detected on the ATUR.
adslAtucLofClear	This trap is sent when the Loss Of Frame detected on the ATUC is over.
adslAturLofClear	This trap is sent when the Loss Of Frame detected on the ATUR is over.
adslAtucLosClear	This trap is sent when the Loss Of Signal detected on the ATUC is over.
adslAturLosClear	This trap is sent when the Loss Of Signal detected on the ATUR is over.
adslAturLprClear	This trap is sent when the Loss Of Power detected on the ATUR is over.

**Table 75** SNMPv2 Traps (continued)

TRAP NAME	DESCRIPTION
adslAtucPerfLofsThreshTrap	The number of times a Loss Of Frame has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Frame has occurred within the 15-minute interval.
adslAtucPerfLossThreshTrap	The number of times a Loss Of Signal has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Signal has occurred within the 15 minute interval.
adslAtucPerfLprsThreshTrap	The number of times a Loss Of Power has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Power has occurred within the 15-minute interval.
adslAtucPerfESsThreshTrap	The number of error seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of error seconds that have occurred within the 15-minute interval.
adslAtucPerfLolsThreshTrap	The number of times a Loss Of Link has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Link has occurred within the 15-minute interval.
adslAturPerfLofsThreshTrap	The number of times a Loss Of Frame has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Frame has occurred within the 15-minute interval.
adslAturPerfLossThreshTrap	The number of times a Loss Of Signal has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Signal has occurred within the 15-minute interval.
adslAturPerfLprsThreshTrap	The number of times a Loss Of Power has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Power has occurred within the 15-minute interval.
adslAturPerfESsThreshTrap	The number of error seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of error seconds that have occurred within the 15-minute interval.
adslAtucSesLThreshTrap	The number of severely errored seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of severely errored seconds that have occurred within the 15-minute interval.
adslAtucUasLThreshTrap	The number of Unavailable seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of Unavailable seconds that have occurred within the 15-minute interval.
adslAturSesLThreshTrap	The number of severely errored seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of severely errored seconds that have occurred within the 15-minute interval.
adslAturUasLThreshTrap	The number of Unavailable seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of Unavailable seconds that have occurred within the 15-minute interval.

## 34.4 SNMP Screen

To open this screen, click **Advanced Application, Access Control, SNMP**.

Figure 117 SNMP

The screenshot shows the SNMP configuration interface. At the top left is an orange circle icon and the text 'SNMP'. At the top right is a 'Return' button. Below these are several input fields: 'Get Community' with 'public', 'Set Community' with 'public', and 'Trap Community' with 'public'. Below these are four rows for 'Trap Destination 1' through '4', each with an IP address field (all containing '0.0.0.0'), a 'Port' field (all containing '162'), and a range '(1~65535)'. At the bottom is a 'Trusted Host(0.0.0.0 means trust all)' field containing '0.0.0.0'. At the very bottom are 'Apply' and 'Cancel' buttons.

The following table describes the labels in this screen.

Table 76 SNMP

LABEL	DESCRIPTION
Return	Click <b>Return</b> to go back to the previous screen.
Get Community	Enter the get community, which is the password for the incoming Get- and GetNext- requests from the management station.
Set Community	Enter the set community, which is the password for incoming Set- requests from the management station.
Trap Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.
Trap Destination 1~4	Enter the IP address of a station to send your SNMP traps to.
Port	Enter the port number upon which the station listens for SNMP traps.
Trusted Host	A “trusted host” is a computer that is allowed to use SNMP with the IES-612-51. <b>0.0.0.0</b> allows any computer to use SNMP to access the IES-612-51. Specify an IP address to allow only the computer with that IP address to use SNMP to access the IES-612-51.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51’s volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.

## 34.5 Service Access Control Screen

To open this screen, click **Advanced Application, Access Control, Service Access Control**.

**Figure 118** Service Access Control

Services	Active	Server Port
Telnet	<input checked="" type="checkbox"/>	23 (1-65535)
FTP	<input checked="" type="checkbox"/>	21 (1-65535)
WEB	<input checked="" type="checkbox"/>	80 (1-65535)
ICMP	<input checked="" type="checkbox"/>	

Apply Cancel

The following table describes the labels in this screen.

**Table 77** Service Access Control

LABEL	DESCRIPTION
Return	Click <b>Return</b> to go back to the previous screen.
Services	Services you may use to access the IES-612-51 are listed here.
Active	Select the <b>Active</b> check boxes for the corresponding services that you want to allow to access the IES-612-51.
Server Port	For Telnet, FTP or web services, you may change the default service port by typing the new port number in the <b>Server Port</b> field. If you change the default port number then you will have to let people (who wish to use the service) know the new port number for that service.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.

## 34.6 Remote Management Screen

Use this screen to configure the IP address ranges of trusted computers that may manage the IES-612-51.

To open this screen, click **Advanced Application, Access Control, Secured Client**.

**Figure 119** Remote Management (Secured Client Setup)

Index	Enable	Start IP Address	End IP Address	Telnet	FTP	Web	ICMP
1	<input checked="" type="checkbox"/>	0.0.0.0	223.255.255.255	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	0.0.0.0	0.0.0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Return

Apply Cancel

The following table describes the labels in this screen.

**Table 78** Remote Management (Secured Client Setup)

LABEL	DESCRIPTION
Return	Click <b>Return</b> to go back to the previous screen.
Index	This is the client set index number. A “client set” is a group of one or more “trusted computers” from which an administrator may use a service to manage the IES-612-51.
Enable	Select this check box to activate this secured client set. Clear the check box if you wish to temporarily disable the set without deleting it.
Start IP Address End IP Address	Configure the IP address range of trusted computers from which you can manage the IES-612-51. The IES-612-51 checks if the client IP address of a computer requesting a service or protocol matches the range set here. The IES-612-51 immediately disconnects the session if it does not match.
Telnet/FTP/Web/ ICMP	Select services that may be used for managing the IES-612-51 from the specified trusted computers.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51’s volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.





---

# PART IV

## Routing Protocol, Alarm and Management

---

Static Routing (235)

Maintenance (237)

Diagnostic (241)

MAC Table (245)

ARP Table (247)

Alarm (249)



## Static Routing

This chapter shows you how to configure the static routing function.

Static routes tell the IES-612-51 how to forward the IES-612-51's own IP traffic when you configure the TCP/IP parameters manually. This is generally useful for allowing management of the device from a device with an IP address on a different subnet from that of the device's IP address (remote management).

To open this screen, click **Routing Protocol, Static Routing**.

**Figure 120** Static Routing

Static Routing

Name

Destination IP Address

IP Subnet Mask

Gateway IP Address

Metric  (1-15)

Page 1 of 1

Index	Name	Destination Address	Subnet Mask	Gateway Address	Metric	Delete
-		Default	-	192.168.1.254	1	-
1		192.168.1.0	255.255.255.0	192.168.1.1	1	<input type="checkbox"/>

The following table describes the labels in this screen.

**Table 79** Static Routing

LABEL	DESCRIPTION
	Use this section to create a new static route.
Name	Type a name to identify this static route. Use up to 31 ASCII characters. Spaces and tabs are not allowed.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Enter the subnet mask for this destination.
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your device that will forward the packet to the destination. The gateway must be a router on the same segment as your device.

**Table 79** Static Routing (continued)

LABEL	DESCRIPTION
Metric	The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Add	Click <b>Add</b> to save the new rule to the IES-612-51’s volatile memory. It then displays in the summary table at the bottom of the screen. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to reset the fields to your previous configuration.
	Use this section to look at a summary of all static routes in the IES-612-51.
Previous Page	Click this to display the preceding page of static route entries.
Next Page	Click this to display the following page of static route entries.
Index	This field displays the index number of the route.
Name	This field displays the name of this static route.
Destination Address	This field displays the IP network address of the final destination.
Subnet Mask	This field displays the subnet mask for this destination.
Gateway Address	This field displays the IP address of the gateway. The gateway is an immediate neighbor of your device that will forward the packet to the destination.
Metric	This field displays the cost of transmission for routing purposes.
Delete	Select the rule(s) that you want to remove in the <b>Delete</b> column, and then click the <b>Delete</b> button.
Cancel	Click <b>Cancel</b> to clear the selected check boxes in the <b>Delete</b> column.

# Maintenance

This chapter explains how to use the maintenance screens.

## 36.1 Maintenance Screen

To open this screen, click **Management**, **Maintenance**.

**Figure 121** Maintenance



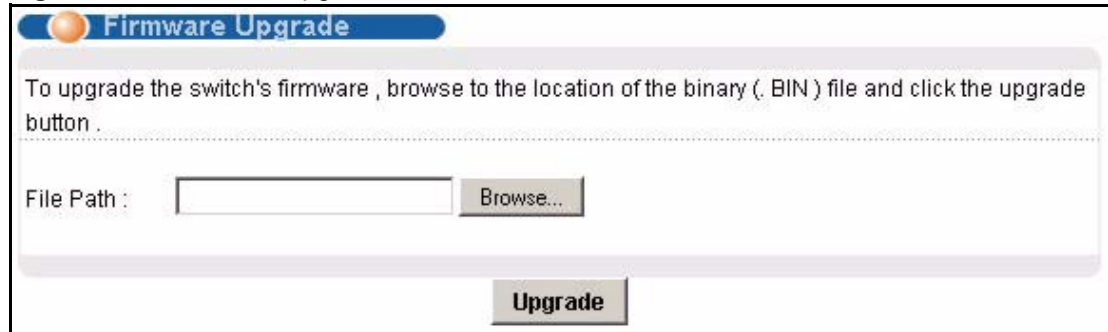
## 36.2 Firmware Upgrade Screen

Use this screen to upgrade your device firmware. See the **System Info** screen to verify your current firmware version number. Make sure you have downloaded (and unzipped) the correct model firmware and version to your computer before uploading to the device.



Be sure to upload the correct model firmware as uploading the wrong model firmware may damage your device.

To open this screen, click **Management**, **Maintenance**, **Click here** (Firmware Upgrade).

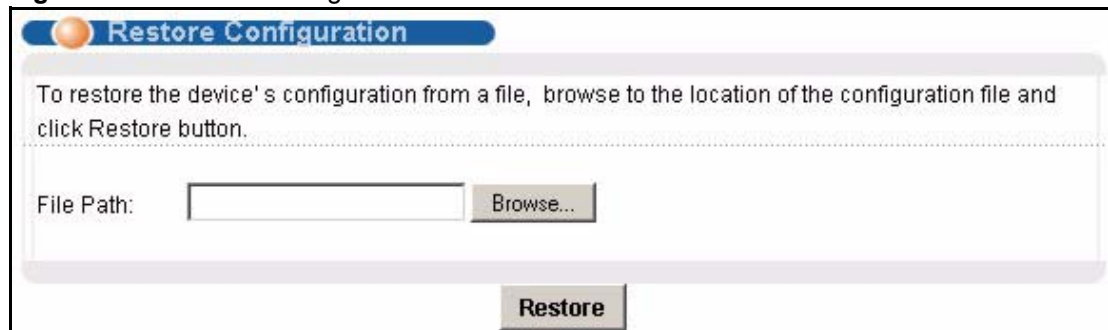
**Figure 122** Firmware Upgrade


Type the path and file name of the firmware file you wish to upload to the device in the **File Path** text box or click **Browse** to locate it. After you have specified the file, click **Upgrade**.

### 36.3 Restore Configuration Screen

Use this screen to load a configuration file from your computer to the device.

To open this screen, click **Management, Maintenance, Click here (Restore Text Configuration)**.

**Figure 123** Restore Configuration


Type the path and file name of the configuration file you wish to restore in the **File Path** text box or click **Browse** to display a **Choose File** screen from which you can locate it. After you have specified the file, click **Restore**. "conf-0" is the name of the configuration file on the device, so your backup configuration file is automatically renamed when you restore using this screen.



**If you load an invalid configuration file, it may corrupt the settings, and you might have to use the console to reconfigure the system.**

### 36.4 Backing Up a Configuration File

Backing up your device configurations allows you to create various “snap shots” of your device from which you may restore at a later date.

Click **Management**, **Maintenance**, and do the following to save your device's configuration to your computer.

- 1 Right-click the **Click here** (Backup Text Configuration) link and click **Save Target As**.  
Or:  
Click the **Click here** (Backup Text Configuration) link and then click **File**, **Save As**.
- 2 In the **Save As** screen, choose a location to save the file on your computer from the **Save in** drop-down list box and type a descriptive name for it in the **File name** list box. Click **Save** to save the configuration file to your computer.



See the CLI chapters to edit the configuration text file.



You can change the “.dat” file to a “.txt” file and still upload it back to the IES-612-51.

## 36.5 Load Factory Defaults

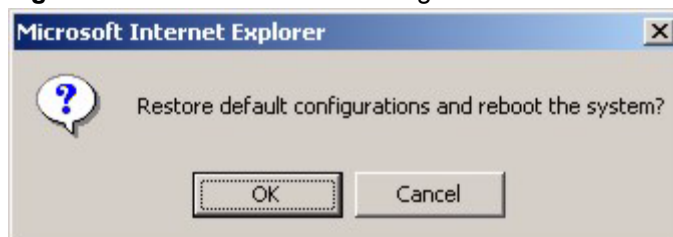
Use this function to clear all device configuration information you configured and return to the factory defaults.



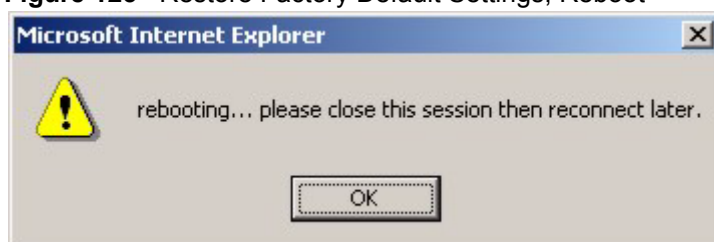
Restoring the default configuration deletes all the current settings. It is recommended to back up the configuration file before restoring the default configuration.

To do this, click **Management**, **Maintenance**, **Click here** (Restore Default Configuration).

**Figure 124** Restore Default Configuration



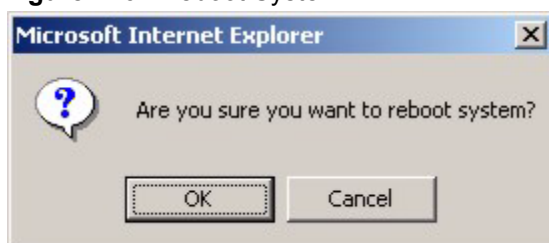
Click **OK** to begin resetting all device configurations to the factory defaults and then wait for the device to restart. This takes up to two minutes. If you want to access the web configurator again, you may need to change the IP address of your computer to be in the same subnet as that of the default device IP address (192.168.1.1).

**Figure 125** Restore Factory Default Settings, Reboot

## 36.6 Reboot System

Use this function to restart the device without physically turning the power off.

To open this screen, click **Management**, **Maintenance**, **Click here** (Reboot System).

**Figure 126** Reboot System

Click **OK**. You then see the screen as shown in [Figure 125 on page 240](#). Click **OK** again and wait for the device to restart. This takes up to two minutes. This does not affect the device's configuration.

## 36.7 Command Line FTP

See [Chapter 41 on page 257](#) for how to upload or download files to or from the device using FTP commands.



# Diagnostic

This chapter explains the Diagnostic screens.

## 37.1 Diagnostic Screen

Use this screen to check system logs, ping IP addresses or perform loopback tests.

To open this screen, click **Management, Diagnostic**.

**Figure 127** Diagnostic

The screenshot shows a web-based diagnostic interface. At the top, there is a blue header bar with an orange circle icon and the word "Diagnostic". Below this is a large, empty white rectangular area, likely for displaying test results or logs. At the bottom, there is a light purple control panel with several sections:

- Syslog/ Event Log:** Contains "Display" and "Clear" buttons.
- IP Ping:** Includes an "IP Address" input field with "0.0.0.0", a "Ping" button, and a numeric input for "Times(1-10)" set to "1".
- Loopback Test:** Includes "Port" (dropdown set to 1), "VPI" (input 0), "VCI" (input 0), and an "OAM F5 Loopback" button.
- LDM Test:** Includes "Port" (dropdown set to 1), a "Set LDM Port" button, and two buttons: "Get LDM Data(raw)" and "Get LDM Data(992.3)".
- SELT:** Includes "Port" (dropdown set to 1), a "Set SELT Port" button, and a "Get SELT Data" button.
- PMM:** Includes "Port" (dropdown set to 1), "Mode" (dropdown set to "LO"), a "Set PMM Mode" button, and a "Get PMM Mode" button.
- ToneDiag:** Includes "Port" (dropdown set to 1) and a "Get ToneDiag data" button.

The following table describes the labels in this screen.

**Table 80** Diagnostic

LABEL	DESCRIPTION
Syslog/ Event Log	Click <b>Display</b> to display a log of events in the multi-line text box. Click <b>Clear</b> to empty the text box and reset the log.
IP Ping	Type the IP address of a device that you want to ping in order to test a connection. In the field to the right specify the number of times that you want to ping the IP address. Click <b>Ping</b> to have the device ping the IP address (in the field to the left).
Loopback Test	Select a port number from the <b>Port</b> drop-down list box and enter a VPI/VC1 to specify a PVC. Click <b>OAM F5 Loopback</b> to perform an OAMF5 loopback test on the specified DSL port. An Operational, Administration and Maintenance Function 5 test is used to test the connection between two DSL devices. First, the DSL devices establish a virtual circuit. Then the local device sends an ATM F5 cell to be returned by the remote DSL device (both DSL devices must support ATM F5 in order to use this test). The results ("Passed" or "Failed") display in the multi-line text box.
LDM Test	Select a port number from the <b>Port</b> drop-down list box and click <b>Set LDM Port</b> to have the IES-612-51 perform line diagnostics on the specified port. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. It takes about one minute for the line diagnostics to finish. The screen displays a message confirming upon which ADSL port line diagnostics will be performed. Click <b>Get LDM Data</b> to display the line diagnostics results after using the <b>Set LDM Port</b> button on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line. Click <b>Get LDM Data(raw)</b> to display the unformatted line diagnostics results. Click <b>Get LDM Data(992.3)</b> to display the line diagnostics results in the format defined in the ITU-T G.992.3 standard.  Note: Wait at least one minute after using Set LDM Port before using Get LDM Data.
SELT	Select a port number from the <b>Port</b> drop-down list box and click <b>Set SELT Port</b> to perform a Single End Loop Test (SELT) on the specified port. This test checks the distance to the subscriber's location.  Note: The port must have an open loop. There cannot be a DSL device, phone, fax machine or other device connected to the subscriber's end of the telephone line.  The SELT takes at least fifteen seconds. To check the status of the SELT or to look at the results when the SELT is complete, select a port number from the <b>Port</b> drop-down list box and click <b>Get SELT Data</b> . The results tell you what gauge of telephone wire is connected to the port and the approximate length of the line.

**Table 80** Diagnostic (continued)

LABEL	DESCRIPTION
PMM	<p>Select a port number from the <b>Port</b> drop-down list box and a power management mode from the <b>Mode</b> drop-down list box and click <b>Set PMM Mode</b> to have the specified port use the specified power management mode.</p> <p>Select <b>L0</b> to turn off power management on the port.</p> <p>Select <b>L2</b> to scale back the power usage to just support the transmission rate that the subscriber is using.</p> <p>Select <b>L3</b> to have the ADSL connection use power saving mode and reduce the rate when there is no traffic. The rate comes back up when there is traffic.</p> <p>The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode.</p> <p>Click <b>Get PMM Mode</b> to display which power mode the ADSL port is currently set to use.</p>
ToneDiag	<p>Select a port number from the <b>Port</b> drop-down list box. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. Click <b>Get ToneDiag data</b> to display the ADSL port's tone diagnostics. The tone diagnostic information displays in the format defined in the ITU-T G.992.3 standard. Use the information to analyze problems with the physical ADSL line.</p> <p>Note: ToneDiag is faster than the LDM test but displays less information.</p>



# MAC Table

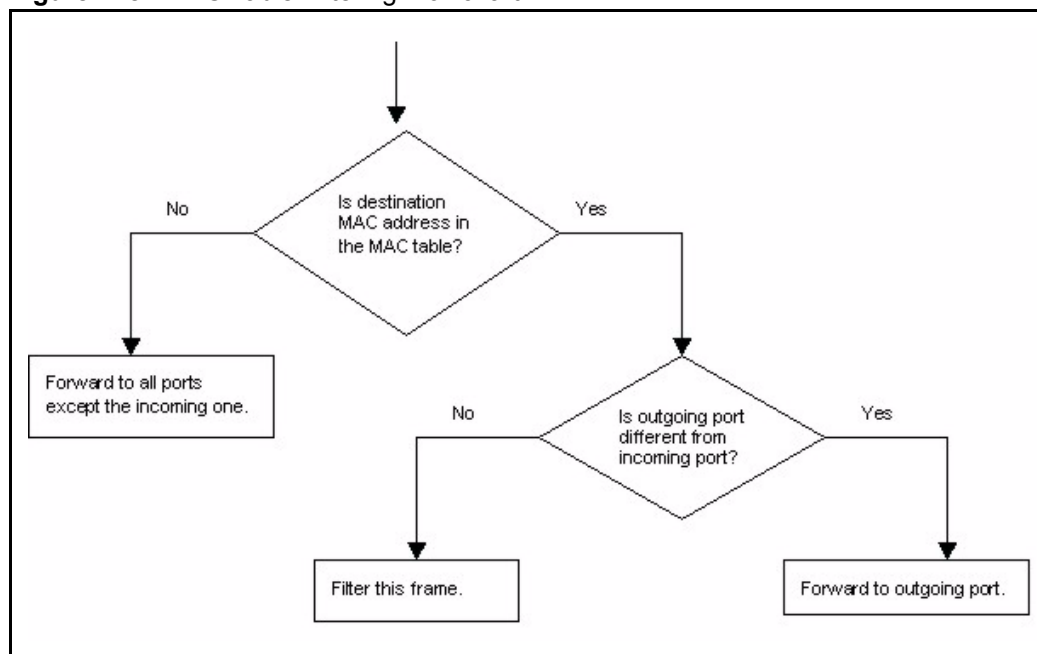
This chapter introduces the MAC Table.

## 38.1 Introduction to MAC Table

The MAC table lists device MAC addresses that are dynamically learned by the IES-612-51. The table shows the following for each MAC address: the port upon which Ethernet frames were received from the device, to which VLAN groups the device belongs (if any) and to which channel it is connected (for devices connected to DSL ports).

The device uses the MAC table to determine how to forward frames. See the following figure.

**Figure 128** MAC Table Filtering Flowchart



- 1 The device examines a received frame and learns the port on which this source MAC address came.
- 2 The device checks to see if the frame's destination MAC address matches a source MAC address already learned in the MAC table.
  - If the device has already learned the port for this MAC address, then it forwards the frame to that port.
  - If the device has not already learned the port for this MAC address, then the frame is flooded to all ports. Too much port flooding leads to network congestion.

- If the device has already learned the port for this MAC address, but the destination port is the same as the port it came in on, then it filters the frame.

## 38.2 MAC Table Screen

To open this screen, click **Management, MAC Table**.

**Figure 129** MAC Table

Index	Port	MAC
1	Enet 1	00:50:8d:48:59:1f

The following table describes the labels in this screen.

**Table 81** MAC Table

LABEL	DESCRIPTION
Show port	Select a port for which to display learned MAC addresses (or display all of them).
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous/Next	Click one of these buttons to show the previous/next screen if all of the information cannot be seen in one screen.
Index	This is the number of the MAC table entry.
Port	This is the port to which the MAC address is associated.
MAC	This is the MAC address of the device from which this incoming frame came.
Refresh	Click <b>Refresh</b> to update the list of dynamically learned MAC addresses.
Flush	Click <b>Flush</b> to remove all of the dynamically learned MAC address entries from the MAC table.

# ARP Table

This chapter describes the ARP Table.

## 39.1 Introduction to ARP Table

Address Resolution Protocol (ARP) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address, also known as a Media Access Control or MAC address, on the local area network.

An IP (version 4) address is 32 bits long. In an Ethernet LAN, MAC addresses are 48 bits long. The ARP Table maintains an association between each MAC address and its corresponding IP address.

### 39.1.1 How ARP Works

When an incoming packet destined for a host device on a local area network arrives at the device, the device's ARP program looks in the ARP Table and, if it finds the address, sends it to the device.

If no entry is found for the IP address, ARP broadcasts the request to all the devices on the LAN. The device fills in its own MAC and IP address in the sender address fields, and puts the known IP address of the target in the target IP address field. In addition, the device puts all ones in the target MAC field (FF.FF.FF.FF.FF.FF is the Ethernet broadcast address). The replying device (which is either the IP address of the device being sought or the router that knows the way) replaces the broadcast address with the target's MAC address, swaps the sender and target pairs, and unicasts the answer directly back to the requesting machine. ARP updates the ARP Table for future reference and then sends the packet to the MAC address that replied.

## 39.2 ARP Table Screen

The ARP table can hold up to 500 entries.

To open this screen, click **Management, ARP Table**.

**Figure 130** ARP Table

ARP Table		
<div> <div>Flush</div> <div>Total 1 ARP entries</div> </div>		
Page 1 of 1		
Index	IP Address	MAC Address
1	192.168.1.33	00:50:8d:48:59:1f
<div> <div>Previous Page</div> <div>Next Page</div> </div>		

The following table describes the labels in this screen.

**Table 82** ARP Table

LABEL	DESCRIPTION
Flush	Click <b>Flush</b> to remove all of the entries from the ARP table.
Total X ARP Entries	This displays the number of entries in the ARP table.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Index	This is the ARP table entry number.
IP Address	This is the learned IP address of a device connected to a port.
MAC Address	This is the MAC address of the device with the listed IP address.
Previous Page Next Page	Click one of these buttons to show the preceding or following screen if the information cannot be displayed in one screen.



# Alarm

This chapter shows you how to display the alarms, sets the severity level of an alarm(s) and where the system is to send the alarm(s) and set port alarm severity level threshold settings.

## 40.1 Alarm

The IES-612-51 monitors for equipment, DSL and system alarms and can report them via SNMP or syslog. You can specify the severity level of an alarm(s) and where the system is to send the alarm(s). You can also set the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.

## 40.2 Alarm Status Screen

This screen displays the alarms that are currently in the system.

To open this screen, click **Alarm**, **Alarm Status**.

**Figure 131** Alarm Status

No	Alarm	Condition	Severity	Timestamp	Source
1	dsl	+line_down	minor	01/04 16:46:48	1

The following table describes the labels in this screen.

**Table 83** Alarm Status

LABEL	DESCRIPTION
Alarm Event Setup	Click <b>Alarm Event Setup</b> to go to a screen where you can configure the severity level of an alarm(s) and where the system is to send the alarm(s). See <a href="#">Section 40.4 on page 251</a> .
Alarm Port Setup	Click <b>Alarm Port Setup</b> to go to a screen where you can configure the alarm severity threshold for recording alarms on an individual port(s). See <a href="#">Section 40.5 on page 254</a> .
Alarm Type	Select which type of alarms to display by <b>Severity</b> , or select <b>All</b> to look at all the alarms.
Refresh	Click this button to update this screen.

**Table 83** Alarm Status (continued)

LABEL	DESCRIPTION
Clear	Click this button to erase the clearable alarm entries.
No	This field displays the index number of the alarm entry in the system.
Alarm	This field displays the alarm category to which the alarm belongs.
Condition	This field displays a text description for the condition under which the alarm applies.
Severity	This field displays the alarm severity level (critical, major, minor or info).
Timestamp	This field displays the month, day, hour, minute and second that the system created the log.
Source	This field displays where the alarm originated. This is either a DSL port number, one of the Ethernet ports (enet 1 or 2), or "eqpt" for the system itself.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous Page	Click this to display the preceding page of entries.
Next Page	Click this to display the following page of entries.

## 40.3 Alarm Descriptions

This table describes alarms that the system can send.

ATUC refers to the downstream channel (for traffic going from the IES-612-51 to the subscriber). ATUR refers to the upstream channel (for traffic coming from the subscriber to the IES-612-51). A "V" in the **CLEARABLE** column indicates that an administrator can remove the alarm.

**Table 84** Alarm Descriptions

NO	ALARM	CONDITION	FACILITY	SNMP	SYSLOG	SEVERITY	CLEARABLE
1	dsl	(5000)line_up	local1	V	V	info	-
2	dsl	(5001)line_down	local1	V	V	minor	V
3	dsl	(5002)ad_perf_lof_thresh	local1	V	V	minor	V
4	dsl	(5003)ad_perf_lof_thresh	local1	V	V	minor	V
5	dsl	(5004)ad_perf_los_thresh	local1	V	V	minor	V
6	dsl	(5005)ad_perf_lop_thresh	local1	V	V	minor	V
7	dsl	(5006)ad_perf_es_thresh	local1	V	V	minor	V
8	dsl	(5007)ad_perf_ses_thresh	local1	V	V	minor	V
9	dsl	(5008)ad_perf_uas_thresh	local1	V	V	minor	V
10	dsl	(5009)ad_atuc_loftrap	local1	V	V	minor	-
11	dsl	(5010)ad_atuc_lostrap	local1	V	V	minor	-

**Table 84** Alarm Descriptions (continued)

NO	ALARM	CONDITION	FACILITY	SNMP	SYSLOG	SEVERITY	CLEARABLE
12	dsl	(5011)ad_atu_r_loftrap	local1	V	V	minor	-
13	dsl	(5012)ad_atu_r_lostrap	local1	V	V	minor	-
14	dsl	(5013)ad_atu_r_lprtrap	local1	V	V	minor	-
15	eqpt	(10000)vol_err	local1	V	V	critical	-
16	eqpt	(10001)temp_err	local1	V	V	critical	-
17	eqpt	(10002)hw_rtc_fail	local1	V	V	critical	-
18	eqpt	(10003)hw_mon_fail	local1	V	V	critical	-
19	eqpt	(10004)cold_start	local1	V	V	info	-
20	eqpt	(10005)warm_start	local1	V	V	info	-
21	sys	(15000)reboot	local1	V	V	info	-
22	sys	(15001)aco	local1	V	V	info	-
23	sys	(15002)alm_clear	local1	V	V	info	-
24	sys	(15003)login_fail	local1	V	V	minor	V
25	sys	(15004)anti_spoofing	local1	V	V	minor	V
26	enet	(20000)up	local1	V	V	info	-
27	enet	(20001)down	local1	V	V	major	V

## 40.4 Alarm Event Setup Screen

This screen lists the alarms that the system can generate along with the severity levels of the alarms and where the system is to send them.

To open this screen, click **Alarm, Alarm Event Setup**.

Figure 132 Alarm Event Setup

Alarm Event Setup				Alarm Status		Alarm Port Setup		
Index	Alarm	Condition Code	Condition	Facility	SNMP	Syslog	Severity	Clearable
<a href="#">1</a>	dsl	5000	line_up	local1	V	V	info	-
<a href="#">2</a>	dsl	5001	line_down	local1	V	V	minor	V
<a href="#">3</a>	dsl	5002	ad_perf_ol_thresh	local1	V	V	minor	V
<a href="#">4</a>	dsl	5003	ad_perf_olf_thresh	local1	V	V	minor	V
<a href="#">5</a>	dsl	5004	ad_perf_los_thresh	local1	V	V	minor	V
<a href="#">6</a>	dsl	5005	ad_perf_lop_thresh	local1	V	V	minor	V
<a href="#">7</a>	dsl	5006	ad_perf_es_thresh	local1	V	V	minor	V
<a href="#">8</a>	dsl	5007	ad_perf_ses_thresh	local1	V	V	minor	V
<a href="#">9</a>	dsl	5008	ad_perf_uas_thresh	local1	V	V	minor	V
<a href="#">10</a>	dsl	5009	ad_atuc_loftrap	local1	V	V	minor	-
<a href="#">11</a>	dsl	5010	ad_atuc_lostrap	local1	V	V	minor	-
<a href="#">12</a>	dsl	5011	ad_atur_loftrap	local1	V	V	minor	-
<a href="#">13</a>	dsl	5012	ad_atur_lostrap	local1	V	V	minor	-
<a href="#">14</a>	dsl	5013	ad_atur_prtrap	local1	V	V	minor	-
<a href="#">15</a>	eqpt	10000	vol_err	local1	V	V	critical	-
<a href="#">16</a>	eqpt	10001	temp_err	local1	V	V	critical	-
<a href="#">17</a>	eqpt	10002	hw_rtc_fail	local1	V	V	critical	-
<a href="#">18</a>	eqpt	10003	hw_mon_fail	local1	V	V	critical	-
<a href="#">19</a>	eqpt	10004	cold_start	local1	V	V	info	-
<a href="#">20</a>	eqpt	10005	warm_start	local1	V	V	info	-
<a href="#">21</a>	sys	15000	reboot	local1	V	V	info	-
<a href="#">22</a>	sys	15001	aco	local1	V	V	info	-
<a href="#">23</a>	sys	15002	alm_clear	local1	V	V	info	-
<a href="#">24</a>	sys	15003	login_fail	local1	V	V	minor	V
<a href="#">25</a>	sys	15004	anti_spoofing	local1	V	V	minor	V
<a href="#">26</a>	enet	20000	up	local1	V	V	info	-
<a href="#">27</a>	enet	20001	down	local1	V	V	major	V

The following table describes the labels in this screen.

Table 85 Alarm Event Setup

LABEL	DESCRIPTION
Alarm Status	Click <b>Alarm Status</b> to go to a screen that displays the alarms that are currently in the system (see <a href="#">Section 40.2 on page 249</a> ).
Alarm Port Setup	Click <b>Alarm Port Setup</b> to go to a screen where you can configure the alarm severity threshold for recording alarms on an individual port(s). See <a href="#">Section 40.5 on page 254</a> .
Index	This field displays the index number of the alarm in the list. Click this to specify the severity level of an alarm(s) and where the system is to send the alarm(s). See <a href="#">Section 40.4.1 on page 253</a> .
Alarm	This field displays the alarm category to which the alarm belongs. <b>eqpt</b> represents equipment alarms. <b>dsl</b> represents Digital Subscriber Line (DSL) alarms. <b>enet</b> represents Ethernet alarms. <b>sys</b> represents system alarms.
Condition Code	This field displays the condition code number for the specific alarm message.
Condition	This field displays a text description for the condition under which the alarm applies.
Facility	This field displays the log facility (local1~local7) on the syslog server where the system is to log this alarm. This is for alarms that send alarms to a syslog server.

**Table 85** Alarm Event Setup (continued)

LABEL	DESCRIPTION
SNMP	This field displays “V” if the system is to send this alarm to an SNMP server. It displays “-” if the system does not send this alarm to an SNMP server.
Syslog	This field displays “V” if the system is to send this alarm to a syslog server. It displays “-” if the system does not send this alarm to a syslog server.
Severity	This field displays the alarm severity level (critical, major, minor or info).
Clearable	This displays “V” if the alarm clear command removes the alarm from the system. It displays “-” if the alarm clear command does not remove the alarm from the system.

### 40.4.1 Edit Alarm Event Setup Screen

Use this screen to specify the severity level of an alarm(s) and where the system is to send the alarm(s).

To open this screen, click **Alarm**, **Alarm Status**. Then, click an alarm’s index number.

**Figure 133** Alarm Event Setup Edit

Alarm	Condition Code	Condition	Facility	SNMP	Syslog	Severity	Clearable
dsl	5000	line_up	Local 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Info	<input type="checkbox"/>

Apply Close

The following table describes the labels in this screen.

**Table 86** Alarm Event Setup Edit

LABEL	DESCRIPTION
Alarm	This field displays the alarm category to which the alarm belongs. <b>eqpt</b> represents equipment alarms. <b>dsl</b> represents Digital Subscriber Line (DSL) alarms. <b>enet</b> represents Ethernet alarms. <b>sys</b> represents system alarms.
Condition Code	This field displays the condition code number for the specific alarm message.
Condition	This field displays a text description for the condition under which the alarm applies.
Facility	The log facility (local1~local7) has the device log the syslog messages to a particular file in the syslog server. Select a log facility (local1~local7) from the drop-down list box if this entry is for sending alarms to a syslog server. See your syslog program’s documentation for details.
SNMP	Select this check box to have the system send this alarm to an SNMP server.
Syslog	Select this check box to have the system send this alarm to a syslog server.
Severity	Select an alarm severity level (critical, major, minor or info) for this alarm. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
Clearable	Select this check box to allow administrators to use the management interface to remove an alarm report generated by this alarm event entry. Select this check box to keep an alarm report generated by this alarm event in the system until the conditions that caused the alarm report are no longer present.

**Table 86** Alarm Event Setup Edit (continued)

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Close	Click <b>Close</b> to exit the screen without saving your changes.

## 40.5 Alarm Port Setup Screen

Use this screen to set the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.

To open this screen, click **Alarm**, **Alarm Port Setup**.

**Figure 134** Alarm Port Setup

Port	Severity
1	Minor
2	Minor
3	Minor
4	Minor
5	Minor
Enet 1	Minor
Enet 2	Minor

Apply Cancel

The following table describes the labels in this screen.

**Table 87** Alarm Port Setup

LABEL	DESCRIPTION
Alarm Status	Click <b>Alarm Status</b> to go to a screen that displays the alarms that are currently in the system (see <a href="#">Section 40.2 on page 249</a> ).
Alarm Event Setup	Click <b>Alarm Event Setup</b> to go to a screen where you can configure the severity level of an alarm(s) and where the system is to send the alarm(s). See <a href="#">Section 40.4 on page 251</a> .
Port	This column lists the device's individual DSL and Ethernet interfaces.
Severity	Select an alarm severity level (critical, major, minor or info) as the threshold for recording alarms on this port. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
Apply	Click <b>Apply</b> to save your changes to the IES-612-51's volatile memory. The IES-612-51 loses these changes if it is turned off or loses power, so use the <b>Config Save</b> link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click <b>Cancel</b> to start configuring the screen again.

---

# PART V

## CLI Commands

---

How to Access and Use the CLI (257)  
Common Commands (263)  
System Commands (267)  
Alarm Commands (275)  
DHCP Commands (281)  
IEEE 802.1Q Tagged VLAN and Isolation Commands (287)  
MAC Commands (295)  
IGMP Commands (299)  
Packet Filter Commands (309)  
Switch and Statistics Commands (313)  
IP Commands (317)  
IP Bridge Commands (321)  
SNMP Commands (323)  
ADSL Commands (325)  
Virtual Channel Commands (353)  
ACL Commands (369)





# How to Access and Use the CLI

This chapter introduces the command line interface (CLI).

## 41.1 Accessing the CLI

Use any of the following methods to access the CLI.

### 41.1.1 Console Port

You can use this method if your IES-612-51 has a console port.

- 1 Connect your computer to the console port on the IES-612-51 using the appropriate cable.
- 2 Use terminal emulation software with the following settings:

**Table 88** Default Settings for the Console Port

SETTING	DEFAULT VALUE
Terminal Emulation	VT100
Baud Rate	9600 bps
Parity	None
Number of Data Bits	8
Number of Stop Bits	1
Flow Control	None

- 3 Press [ENTER] to open the login screen.

### 41.1.2 Telnet

- 1 Connect your computer to one of the Ethernet ports.
- 2 Open a Telnet session to the IES-612-51's IP address. If this is your first login, use the default values.

**Table 89** Default Management IP Address

SETTING	DEFAULT VALUE
IP Address	192.168.1.1
Subnet Mask	255.255.255.0

Make sure your computer IP address is in the same subnet, unless you are accessing the IES-612-51 through one or more routers. In the latter case, make sure remote management of the IES-612-51 is allowed via Telnet.

### 41.1.3 SSH

You can use this method if your IES-612-51 supports SSH connections.

- 1 Connect your computer to one of the Ethernet ports.
- 2 Use a SSH client program to access the IES-612-51. If this is your first login, use the default values in [Table 89 on page 257](#) and [Table 90 on page 258](#). Make sure your computer IP address is in the same subnet, unless you are accessing the IES-612-51 through one or more routers.

## 41.2 Logging in

Use the administrator username and password. If this is your first login, use the default values. In some IES-612-51 models you may not need to enter the user name.

**Table 90** Default User Name and Password

SETTING	DEFAULT VALUE
User Name	admin
Password	1234

The IES-612-51 automatically logs you out of the management interface after five minutes of inactivity. If this happens, simply log back in again. Use the `sys stdio set` command to extend the idle timeout. For example, the IES-612-51 automatically logs you out of the management interface after 60 minutes of inactivity after you use the `sys stdio set 60` command. Use the `sys stdio show` command to display the current idle timeout setting.

## 41.3 Command Conventions

Command descriptions follow these conventions:

- Commands are in *courier new* font.
- Required input values are in angle brackets `<>`; for example, `ping <ip-address>` means that you must specify an IP address for this command.
- Optional fields are in square brackets `[]`; for instance in the `show logins [name]` command, the *name* field is optional.

The following is an example of a required field within an optional field: `snmp-server [contact <system contact>]`, the *contact* field is optional. However, if you use *contact*, then you must provide the *system contact* information.

- The `|` (bar) symbol means “or”.
- *italic* terms represent user-defined input values; for example, in `sys datetime date [year month date]`, *year month date* can be replaced by the actual year month and date that you want to set, for example, 2007 08 15.

- A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the “Enter” or “Return” key on your keyboard.
- <cr> means press the [ENTER] key.
- An arrow (→) indicates that this line is a continuation of the previous line.

Command summary tables are organized as follows:

**Table 91** Table Title

COMMAND	DESCRIPTION	P
switch dhcp snooping show <port-list>	Use this command to display the current DHCP snooping settings of the specified port(s).	L/L
statistics dhcp counter [<port-list> [clear]]	Use this command to display or clear the summary of DHCP packets on the specified port(s).	L/L
statistics dhcp snooping <port-list>	Use this command to look at the DHCP snooping table on the specified port(s).	L/L

The **Table** title identifies commands or the specific feature that the commands configure.

The **COMMAND** column shows the syntax of the command.

The **DESCRIPTION** column explains what the command does. It may also identify legal input values.

The **P** column identifies the privilege level needed to run the command (see [Section 41.5 on page 260](#)). The first letter identifies the privilege level needed to use the command (**L** = low, **M** = medium or **H** = high) and the second letter indicates the privilege level need to perform the function in the web configurator (**L** = low or **H** = high).

A long list of pre-defined values may be replaced by a command input value ‘variable’ so as to avoid a very long command in the description table. Refer to the command input values table if you are unsure of what to enter.

**Table 92** Common Command Input Values

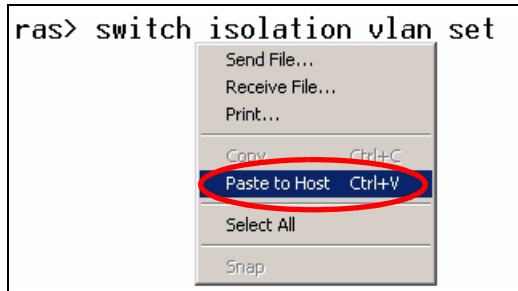
LABEL	DESCRIPTION
<i>description</i>	Used when a command has a description field in order to add more detail.
<i>ip-address</i>	An IP address in dotted decimal notation. For example, 192.168.1.3.
<i>mask</i>	The subnet mask in dotted decimal notation, for example, 255.255.255.0.
<i>mask-bits</i>	The number of bits in an address's subnet mask. For example type /24 for a subnet mask of 255.255.255.0.
<i>port</i>	An xDSL port number.
<i>hostname</i>	The hostname can be an IP address or domain name.
<i>name</i>	Used for the name of a rule, policy, set, group and so on.
<i>number</i>	Used for a number, for example 10, that you have to enter.



Commands are case sensitive! Enter commands exactly as seen in the command interface. Remember to also include underscores if required.

## Copy and Paste Commands

You can copy and paste commands directly from this document into your terminal emulation console window (such as HyperTerminal). Use right-click (not [CTRL]-[V]) to paste your command into the console window as shown next.



## 41.4 Using Shortcuts and Getting Help

This table identifies some shortcuts in the CLI, as well as how to get help.

**Table 93** CLI Shortcuts and Help

COMMAND / KEY(S)	DESCRIPTION
↑↓ (up/down arrow keys)	Scrolls through the list of recently-used commands. You can edit any command or press [ENTER] to run it again.
?	Displays the keywords and/or input values that are allowed in place of the ?.
help	Displays the (full) commands that are allowed in place of help.

Use the `help` command to view the executable commands on the IES-612-51. Follow these steps to create a list of supported commands:

- 1 Log into the CLI.
- 2 Type `help` and press [ENTER]. A list comes up which shows all the commands available for this device.

```

ras> help
sys          adsl          alarm          switch
ip           statistics    config         exit
ras>

```

## 41.5 Command Privilege Levels

There is a high, middle or low privilege level for each command.

High privilege commands are only available to administrators with high privilege access. High privilege commands include things like creating administrator accounts, restarting the system and resetting the system to its factory defaults. Administrators with high privilege access can use all commands including the lower privilege commands.

Administrators with middle privilege access can use middle or low privilege commands.

Administrators with the low privilege level are restricted to using only low privilege commands. Low privilege commands are read only.

## 41.6 Saving Your Configuration

In the IES-612-51 some commands are saved as you run them and others require you to run a save command. See the related section of this guide to see if a save command is required.



---

Unsaved configuration changes are lost once you restart the IES-612-51

---

## 41.7 Logging Out

Use the `exit` command to log out of the CLI.



## Common Commands

This chapter introduces some of the more commonly-used commands in the IES-612-51. For more detailed usage, see the corresponding feature chapter in this guide.

In the following examples, `ras` is the default command prompt. If you configure a system name, then the configured system name displays as the command prompt.

### 42.1 Port Selection

Subscriber xDSL ports are identified in a command by either a port number, or by a port list. Where a port list is specified, you can enter a single port number, a list of xDSL ports (for example 1, 3, 5), a range of ports (for example 6~10) a list and a range (for example 1, 2, 3, 6~10), or use an asterisk (\*) to indicate all ports.

For example, the following command displays the ADSL status of ports 2, 8 and 15 to 19.

```

ras> adsl show 2,8,15~19
port enable mode      up/downstream profile
-----
   2    V    auto      512/  9088 DEFVAL_MAX
   8    V    auto      512/  9088 DEFVAL_MAX
  15    V    auto      512/  9088 DEFVAL_MAX
  16    V    auto      512/  9088 DEFVAL_MAX
  17    V    auto      512/  9088 DEFVAL_MAX
  18    V    auto      512/  9088 DEFVAL_MAX
  19    V    auto      512/  9088 DEFVAL_MAX

Subscriber Info:
port name              tel
-----
   2 -                  -
   8 -                  -
  15 -                  -
  16 -                  -
  17 -                  -
  18 -                  -
  19 -                  -

```

## 42.2 IP Status

Use the following command to view IP statistics.

```

ras> ip show
interface ip                netmask
-----
Ethernet  192.168.1.15      255.255.255.0
default gateway: 192.168.1.254

```

## 42.3 Configuration Status

Use the `config show <sys|sw|adsl|ip|stat|all> [nopause]` command to view the IES-612-51's current configuration.

`sys` - view system configuration information.

`sw` - view switch configuration information.

`adsl` - view ADSL port configuration information.

`ip` - view IP configuration information.

`stat` - view statistics.

`all` - view all the above information.

`nopause` - view the information without being prompted to continue after each section.

```

ras> config show adsl
===== adsl =====
===== adsl/show =====
port enable mode      up/downstream profile
-----
   1   V   auto      512/  9088 DEFVAL_MAX
   2   V   auto      512/  9088 DEFVAL_MAX
   3   V   auto      512/  9088 DEFVAL_MAX
   4   V   auto      512/  9088 DEFVAL_MAX
   5   V   auto      512/  9088 DEFVAL_MAX
   6   V   auto      512/  9088 DEFVAL_MAX
   7   V   auto      512/  9088 DEFVAL_MAX
   8   V   auto      512/  9088 DEFVAL_MAX
   9   V   auto      512/  9088 DEFVAL_MAX
  10   V   auto      512/  9088 DEFVAL_MAX
-----Snip-----

```



## 42.4 Reset to Defaults

Use the following command to reset the IES-612-51 to the factory defaults. Make sure you back up your current configuration first (using the web configurator or SMT). The IES-612-51 will restart and the console port speed will also reset to 9,600 bps.

```
ras> config restore

System will reboot automatically after restoring default configuration.
Do you want to proceed(y/n)? >
restoring configuration...
saving configuration to flash...
```

## 42.5 Port and VLAN Isolation

Turn on port isolation to block communications between subscriber ports. When you enable port isolation, you do not need to configure the VLAN to isolate subscribers.

Turn on VLAN isolation to block communications between subscribers in different VLAN if you do not block communications between subscriber ports.

### 42.5.1 Isolation Show Command

Use this command to display the current setting of the subscriber isolation feature.

```
ras> switch isolation show
system isolation: enabled
system switch mode : stand alone
```

### 42.5.2 Port Isolation Enable Command

Use this command to turn on the port isolation feature.

```
ras> switch isolation enable
```

### 42.5.3 Port Isolation Disable Command

Use this command to turn off the port isolation feature.

```
ras> switch isolation disable
```

## 42.6 Statistics Monitor Command

Use this command to show the current hardware status (voltage, temperature, fan speed and alarm status).

```

ras> statistics monitor show
Hardware monitor status: enabled

```

	nominal	limit(hi)	limit(lo)	current	min	max	avg	status
---	---	---	---	---	---	---	---	---
v1 (v)	1.200	1.344	1.056	1.230	1.230	1.243	1.230	Normal
v2 (v)	1.800	1.944	1.656	1.820	1.820	1.820	1.820	Normal
v3 (v)	3.300	3.564	3.036	3.257	3.257	3.257	3.257	Normal
v4 (v)	18.000	19.440	16.560	18.175	18.175	18.175	18.175	Normal

	limit(hi)	limit(lo)	current	min	max	avg	status
---	---	---	---	---	---	---	---
t1 (c)	97.000	-55.000	29.000	23.000	29.000	26.000	Normal
t2 (c)	97.000	-55.000	36.000	23.000	36.000	33.000	Normal
t3 (c)	97.000	-55.000	31.000	23.000	31.000	28.000	Normal

## 42.7 Statistics Port Command

Use this command to display or erase port statistics. The following example displays port statistics for ADSL port 1.

```

ras> statistics port 1
[adsl port 1]
tx packets      : 20
rx packets      : 0
tx uni-packets  : 1
rx uni-packets  : 0
tx nonuni-packets : 19
rx nonuni-packets : 0
tx discard packets: 0
rx discard packets: 0
errors          : 0
tx rate (bytes/s): 0
rx rate (bytes/s): 128
tx bytes        : 5904
rx bytes        : 0

```

See [Chapter 42 on page 266](#) for details on the port statistics fields.

# System Commands

This chapter describes the system commands. Use the system commands to view and change basic information about your IES-612-51.

## 43.1 System Commands

The following table describes the `sys` commands not described elsewhere in this guide (see [Chapter 53 on page 323](#) for information on the `sys snmp` commands).

**Table 94** System Commands

COMMAND	DESCRIPTION	P
<code>sys client disable &lt;index&gt;</code>	Turns off a secure client.	H/H
<code>sys client enable &lt;index&gt;</code>	Turns on a secure client.	H/H
<code>sys client set &lt;index&gt; &lt;start-ip&gt; &lt;end-ip&gt; [[telnet] [ftp] [web] [icmp] [snmp]]</code>	Sets a secured client set: a range of IP addresses from which you can manage the device and the protocols that can be used.	H/H
<code>sys client show</code>	Displays the device's secured client settings.	M/L
<code>sys date set &lt;yyyy mm dd&gt;</code>	Sets the system's date.	H/H
<code>sys date show</code>	Displays the system's current date.	L/L
<code>sys info contact &lt;contact&gt;</code>	Sets contact person information.	M/H
<code>sys info hostname &lt;hostname&gt;</code>	Sets the system name.	M/H
<code>sys info location &lt;location&gt;</code>	Sets location information.	M/H
<code>sys info show</code>	Displays general system information.	L/L
<code>sys log clear</code>	Clears the device's logs.	H/H
<code>sys log show</code>	Displays the device's logs.	M/L
<code>sys monitor disable</code>	Turns the hardware monitor off.	H/H
<code>sys monitor enable</code>	Turns the hardware monitor on.	H/H
<code>sys monitor show</code>	Displays the hardware monitor's statistics.	L/L
<code>sys monitor tlimit &lt;index&gt; &lt;high&gt; &lt;low&gt;</code>	Sets the maximum ( <i>high</i> ) or minimum ( <i>low</i> ) temperature at the specified temperature sensor. You can specify a temperature with up to three digits after a decimal point (-50.025 for example). Temperature sensor locations: <i>index</i> : 1=DSL, 2=CPU, 3=HW monitor	H/H

**Table 94** System Commands (continued)

COMMAND	DESCRIPTION	P
sys monitor vlimit <index> <high> <low>	Sets the maximum (<high>) or minimum (<low>) voltage at the specified voltage sensor. You can specify a voltage with up to three digits after a decimal point (0.941 for example). Normal voltage at each sensor: <i>index:</i> 1=1.2v, 2=1.8v, 3=3.3v, 4=24v	H/H
sys reboot [show sec cancel]	Sets the reboot timer or displays the timer and remaining time for reboot. If a reboot has been scheduled, use this command to prevent a reboot.	H/H
sys server disable <telnet ftp web icmp>	Turns a service off.	H/H
sys server enable <telnet ftp web icmp>	Turns a service on.	H/H
sys server port <telnet ftp web> <port>	Sets a port for a service.	H/H
sys server show	Displays the device's service status and port numbers.	M/L
sys stdio set <minute>	Sets the current stdio timeout. Enter 0 to have no timeout.	H/H
sys stdio show	Displays the current stdio timeout.	L/L
sys syslog disable	Turns off the syslog logging.	H/H
sys syslog enable	Turns on the syslog logging.	H/H
sys syslog server <ip-address>	Sets the IP address of the syslog server.	H/H
sys syslog show	Displays the syslog settings.	M/L
sys time set <hh> [<mm> [<ss>]]	Sets the system's time.	H/H
sys time show	Displays the system's current time.	L/L
sys timeserver set <daytime> <ip-address> [nosync]	Sets the time service protocol and the time server's IP address.	H/H
sys timeserver set <none>	Sets the system to not use a time server.	H/H
sys timeserver set <time ntp> <ip> <utc[<+ ->0100~1200]> [nosync]	Sets the time service protocol, time server's IP address and the device's time zone.	H/H
sys timeserver show	Displays the system's time server.	M/L
sys timeserver sync	Retrieves the date and time from the time server.	H/H
sys user auth <local radius landr>	Sets the authentication method.	H/H
sys user delete <name>	Removes the specified user name of multi-login.	H/H
sys user disable <name>	Turns off the specified user name of multi-login.	H/H
sys user enable <name>	Turns on the specified user name of multi-login.	H/H
sys user online	Displays online user info.	M/~
sys user server <ip-address> <port> <secret> [high middle low deny]	Set remote authentication server's IP address and secret.	H/H
sys user set <username> <password> <high middle low>	Creates or edits the password and privilege level of the specified user name.	H/H

**Table 94** System Commands (continued)

COMMAND	DESCRIPTION	P
<code>sys user show</code>	Displays the authentication mode, RADIUS server settings and user info.	M/L
<code>sys wdog set &lt;msec&gt;</code>	Sets the watchdog count. 0 turns the watchdog off.	H/~
<code>sys wdog show</code>	Displays the current watchdog firmware protection feature status and timer.	H/~

### 43.1.1 Idle Timeout Set Command Example

By default, the IES-612-51 automatically logs you out of the management interface after five minutes of inactivity. Use the `sys stdio set` command to extend the idle timeout. The following example extends the idle timeout to 120 minutes.

```
ras> sys stdio set 120
```

### 43.1.2 Basic System Information Command Examples

Use the following command to view the firmware and bootbase version.

```
ras> sys info show
  Hostname:
  Location:
  Contact:
    Model: IES-xxxx
  ZyNOS version: V3.52(ABA.0) | 07/19/2006
  F/W size: 2748104
  MAC address: 00:00:00:00:00:00
  System up time: 0(days) : 0:24:37
  Bootbase version: V1.03(AAM1212-51) | 02/18/2005
  F/W build date: Jul 18 2006 15:48:00
  DSP code version: 6.04.0003
  Hardware version:
  Serial number:
```

Use the following commands to view the IES-612-51's time and date.

```
ras> sys time show
current time is 16:46:45
ras> sys date show
current date is Tue 2007/09/04
```

Use the following command to restart your IES-612-51 right away.

```

ras> sys reboot

Bootbase Version: VARY1.04 | 08/20/2007
RAM:Size = 32 Mbytes
FLASH: Intel 64M

ZyNOS Version: V3.53(ARY.0)b6 | 08/31/2007

Press any key to enter debug mode within 3 seconds.
.....

```

### 43.1.3 Logs Command Examples

Use the following commands to display all logs or just error logs. Logs are very useful for troubleshooting. If you are having problems with your IES-612-51, customer support may request that you send them the logs.

```

ras> sys log show
 1 Tue Sep 04 16:17:19 2007 1_Tell_P INFO Session Begin!
 2 Tue Sep 04 14:22:39 2007 Console INFO Session End!
 3 Tue Sep 04 14:22:39 2007 Console INFO Last errorlog repeat 1 Times
 4 Tue Sep 04 14:17:37 2007 Console INFO Session Begin!
 5 Tue Sep 04 14:17:33 2007 Console WARN Incorrect Password!
 6 Tue Sep 04 14:17:10 2007 PSSV INFO System Cold Start!
 7 Tue Sep 04 14:17:02 2007 iw_app INFO Ether 1 Link Up(SN=2): 100/100!
 8 Tue Sep 04 14:16:59 2007 PINI INFO Change time server to none.

```

#### 43.1.3.1 Log Format

The common format of the system logs is: <item no> <time> <process> <type> <log message>.

**Table 95** Log Format

LABEL	DESCRIPTION
<item no>	This is the index number of the log entry.
<time>	This is the time and date when the log was created.
<process>	This is the process that created the log.
<type>	This identifies what kind of log it is. "INFO" identifies an information log. "WARN" identifies a warning log.
<log message>	This is the log's detailed information (see <a href="#">Table 96 on page 271</a> )

### 43.1.3.2 Log Messages

The following table lists and describes the system log messages.

**Table 96** Log Messages

LOG MESSAGE	TYPE	DESCRIPTION
ADSL <port> Link Up(SN=<seq no>): <ds rate>/<us rate>! or ADSL Link Info: NM:<ds NM>/<us NM>!	INFO	An ADSL port established a connection. port - port number seq no - sequence number of the connection ds rate - downstream rate us rate - upstream rate us NM - upstream noise margin ds NM - downstream noise margin
ADSL <port> Link Down(SN=<seq no>)!	WARN	An ADSL port lost its connection. port - port number seq no - sequence number of the connection
ADSL <port> Link Loss of Power Dying-Gasp Event!	WARN	The subscriber device connected to an ADSL port experienced a loss of power (Dying-Gasp). port - port number
Change time server to none.	INFO	The time server setting was changed to none.
Change time server to TIME. IP:<ip> Timezone: <time zone>.	INFO	The time server protocol setting was changed to TIME. The time server's IP address and time zone are displayed.
Change time server to DAYTIME. IP: <ip>	INFO	The time server protocol setting was changed to DAYTIME. The time server's IP address and time zone are displayed.
Change time server to NTP. IP: <ip> Timezone: <time zone>	INFO	The time server protocol setting was changed to NTP. The time server's IP address and time zone are displayed.
External alarm is triggered!	WARN	External alarm input was detected.
Ether <port> Link Down(SN=N)!	WARN	An Ethernet link is down. port - 1 is ENET1, 2 is ENET2 SN - an internal sequencer number
Ether N Link Up(SN=N): <speed>!	INFO	An Ethernet link is up. port - 1 is ENET1, 2 is ENET2 SN - an internal sequencer number speed - Ethernet connection speed, for example 1000M or 100M
External alarm is released.	INFO	An external alarm is over and the input has returned to a normal state.
FAN RPM DOWN: dev: <id> Limit:N value:N!	WARN	A fan's RPM went too low. id - 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - minimum (low) fan (RPM) value - the measured fan RPM
FAN RPM OK: dev: <id> Limit:N value:N!	INFO	A fan's RPM returned to the normal range. id - 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - maximum (high) or minimum fan (RPM) that had been breached value - the measured fan RPM

**Table 96** Log Messages (continued)

LOG MESSAGE	TYPE	DESCRIPTION
FAN RPM OVER: dev: <id> Limit:N value:N!	WARN	A fan's RPM went too high. id - 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - maximum (high) fan (RPM) value - the measured fan RPM
Incorrect Password!	WARN	Someone attempted to use the wrong password to start a console, telnet or FTP session (see the <process> field for the type of session).
Session Begin!	INFO	A console, telnet or FTP session has begun (see the <process> field for the type of session).
Session End!	INFO	A console telnet or FTP session has terminated (see the <process> field for the type of session).
Sync with timeserver <ip> failed!	WARN	The device was not able to synchronize the time with the time server at the listed IP address.
Sync with timeserver <ip> successful!	INFO	The device synchronized the time with the time server at the listed IP address.
Received File <file>!	INFO	A file was uploaded to the IES-612-51 by FTP. file - received file's name
Received Firmware Checksum Error!	WARN	A checksum error was detected during an attempted FTP firmware upload.
Received Firmware Invalid!	WARN	Someone attempted to upload a firmware file with a wrong identity via FTP.
Received Firmware Size too large!	WARN	The file size was too large with an attempted FTP firmware upload.
THERMO LOW VOLTAGE: dev: <id> limit: <threshold> value: <voltage>!	WARN	The device's voltage went above the accepted operating range. id - 1=1.2v, 2=1.8v, 3=3.3v, 4=24v threshold - voltage limit voltage - voltage of the DC power when logged
THERMO LOW TEMPERATURE: dev:<id> threshold:<threshold>(degree C) value:<temp>(degree C)!	WARN	The temperature was too low at one of the temperature sensors. id - 0: sensor near the ADSL chipset, 1: sensor near the CPU, 2: thermal sensor chip threshold - temperature limit temp - temperature when the entry was logged
THERMO OVER TEMPERATURE: dev:<id> threshold:<threshold>(degree C) value:<temp>(degree C)!	WARN	The temperature was too high at one of the temperature sensors. id - 0: sensor near the ADSL chipset, 1: sensor near the CPU, 2: thermal sensor chip threshold - temperature limit temp - temperature when the entry was logged
THERMO OVER TEMPERATURE released: dev:<id> threshold:<threshold>(degree C) value:<temp>(degree C)!	INFO	The temperature at one of the temperature sensors has come back to normal. id - 0: sensor near the ADSL chipset, 1: sensor near the CPU, 2: thermal sensor chip threshold - temperature limit temp - temperature when the entry was logged



**Table 96** Log Messages (continued)

LOG MESSAGE	TYPE	DESCRIPTION
THERMO OVER VOLTAGE: dev: <id> limit: <threshold> value: <voltage>!	WARN	The voltage at one of the voltage sensors went above the accepted operating range. id - 1=1.2v, 2=1.8v, 3=3.3v, 4=24v threshold - voltage limit voltage - voltage of the DC power when logged
THERMO OVER VOLTAGE released: nominal:<nominal>(mV) value:<voltage> (mV)!	INFO	The device's voltage is back inside the accepted operating range. nominal - nominal voltage of the DC power voltage - voltage of the DC power when logged

### 43.1.4 Clearing the Log

Syntax:

```
ras> sys log clear
```

This command clears the system error log.



If you clear a log (using the `sys log clear` command), you cannot view it again.



## Alarm Commands

This chapter describes the alarm management commands. Use these commands to view, customize and clear alarms. You can also set the device to report alarms to an SNMP or syslog server that you specify.

### 44.1 General Alarm Command Parameters

The following table describes commonly used alarm command parameter notation.

**Table 97** General Alarm Command Parameters

NOTATION	DESCRIPTION
<i>alarm</i>	Specify a category of alarms. <i>eqpt</i> represents equipment alarms. <i>dsl</i> represents Digital Subscriber Line (DSL) alarms. <i>enet</i> represents Ethernet alarms. <i>sys</i> represents system alarms. <i>all</i> specifies every alarm category.
<i>severity</i>	Specify an alarm severity level ( <i>critical</i> , <i>major</i> , <i>minor</i> , <i>info</i> or <i>all</i> ). Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
<i>condition</i>	This is the text description for the condition under which the alarm applies. Use the alarm tablelist to find alarm conditions.

### 44.2 Alarm Commands

The following table describes the alarm commands.

**Table 98** alarm Commands

COMMAND	DESCRIPTION	P
alarm show [<severity> all] [<alarm> all] [<condition> all] [detail]	This command displays the current alarms by severity, alarm category or alarm condition. <i>detail</i> : Display in-depth alarm information.	L/L
alarm port show [<severity> all]	This command displays port alarm severity level thresholds. The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.	L/L

**Table 98** alarm Commands (continued)

COMMAND	DESCRIPTION	P
alarm port set <all enet1 enet2 <port>> <severity>	This command sets the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold. all enet1 enet2 port: Ports on the IES-612-51.	M/H
alarm tablelist [<alarm> all] [<severity> all] [<fac> all] [<target>[,<target> ] [<condition> all]	This command lists alarm settings. <i>fac</i> : The log facility (local1~local7) that has the device log the syslog messages to different files in the syslog server. See your syslog program's documentation for details. <i>target</i> : snmp syslog all The type of alarm messages that the device is to send (SNMP, syslog or all).	L/L
alarm history show [<severity> all] [<alarm> all] [<condition> all] [<sdate> all] [<edate> all] [for rev] [detail]	This command displays historic alarms by severity, alarm category, alarm condition and/or dates. <i>sdate</i> : The start date, in yyyy/mm/dd format. <i>edate</i> : The end date, in yyyy/mm/dd format. <i>for rev</i> : The displaying order. Use <i>for</i> to display in chronological order starting from the oldest alarm. Use <i>rev</i> to display in reverse chronological order starting from the most recent alarm. <i>detail</i> : Display in-depth alarm information.	L/~
alarm history clear [<alarm> all <condition> all] <severity>	This command removes historic alarm entries by alarm category, alarm condition or severity.	M/~
alarm xedit <<alarm> all> <<condition> <condcode>> <severity> <fac> <target>[,<target>] [clearable unclearable]	This command sets the severity level of an alarm(s) and where the system is to send the alarm(s). Use the <code>alarm tablelist</code> command to display alarm setting details. <i>cond</i> : all condition This is the text description for the condition under which the alarm applies. Use the <code>alarm tablelist</code> to find alarm conditions. <i>condcode</i> : The condition code is the number of a specific alarm message. Use the <code>alarm tablelist</code> to find alarm condition codes. <i>severity</i> : Specify an alarm severity level (critical, major, minor or info) for this alarm. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe. <i>fac</i> : The log facility (local1~local7) has the device log the syslog messages to a particular file in the syslog server. Set this if this entry is for sending alarms to a syslog server. See your syslog program's documentation for details. <i>target</i> : snmp syslog all The type of alarm messages that the device is to send (SNMP, syslog or all). You can specify more than one, separated by commas. <i>clearable unclearable</i> This sets whether or not the alarm clear command removes the alarm from the system.	M/H

**Table 98** alarm Commands (continued)

COMMAND	DESCRIPTION	P
alarm cutoff	This command cancels an alarm. This stops the sending of the alarm signal current. This is useful in stopping an alarm if you have the alarm output connector pins connected to a visible or audible alarm. The alarm entry remains in the system.	M/~
alarm clear	This command erases the clearable alarm entries.	M/H

### 44.2.1 Alarm Show Command Example

The following example shows the results of using this command.

The source is where the alarm originated. This is either a DSL port number, one of the Ethernet ports (enet 1 or 2), or “eqpt” for the system itself.

```
ras> alarm show
```

```
[current alarm list]
```

no	alarm	condition	severity	timestamp	source
1	eqpt	+fan_err	critical	09/19 12:49:10	eqpt 1
2	eqpt	+fan_err	critical	09/19 12:49:10	eqpt 3
3	eqpt	+fan_err	critical	09/19 12:49:10	eqpt 2

## 44.2.2 Alarm Port Show Command Example

This example shows the results of using this command.

```
ras> alarm port show

    Press any key to continue, 'e' to exit, 'n' for nopause

no      ifindex      severity
-----
01      01          minor
02      02          minor
03      03          minor
04      04          minor
05      05          minor
06      06          minor
07      07          minor
08      08          minor
09      09          minor
10      10          minor
11      11          minor
12      12          minor
13      13          minor
14      14          minor
15      15          minor
16      16          minor
17      17          minor
18      18          minor
19      19          minor
20      20          minor

    Press any key to continue, 'e' to exit, 'n' for nopause
```

## 44.2.3 Alarm Port Set Command Example

The following example has the IES-612-51 record only critical alarms on DSL port 7.

```
ras> alarm port set 7 critical
```

## 44.2.4 Alarm Tablelist Command Example

The following example displays the supported minor level alarms for all alarm categories, facilities, types of alarm messages and conditions.

```

ras> alarm tablelist
no alarm          condition          facility snmp syslog severity clearable
-----
--
 1 dsl  ( 5000)line_up              local1   V    V    info    -
 2 dsl  ( 5001)line_down            local1   V    V    minor   V
 3 dsl  ( 5002)ad_perf_lol_thresh   local1   V    V    minor   V
 4 dsl  ( 5003)ad_perf_lof_thresh   local1   V    V    minor   V
 5 dsl  ( 5004)ad_perf_los_thresh   local1   V    V    minor   V
 6 dsl  ( 5005)ad_perf_lop_thresh   local1   V    V    minor   V
 7 dsl  ( 5006)ad_perf_es_thresh    local1   V    V    minor   V
 8 dsl  ( 5007)ad_perf_ses_thresh   local1   V    V    minor   V
 9 dsl  ( 5008)ad_perf_uas_thresh   local1   V    V    minor   V
10 dsl  ( 5009)ad_atuc_loftrap       local1   V    V    minor   -
11 dsl  ( 5010)ad_atuc_lostrap       local1   V    V    minor   -
12 dsl  ( 5011)ad_atur_loftrap       local1   V    V    minor   -
13 dsl  ( 5012)ad_atur_lostrap       local1   V    V    minor   -
14 dsl  ( 5013)ad_atur_lprtrap       local1   V    V    minor   -
15 eqpt (10000)vol_err               local1   V    V    critical -
16 eqpt (10001)temp_err              local1   V    V    critical -
17 eqpt (10002)fan_err               local1   V    V    critical -
18 eqpt (10003)hw_rtc_fail           local1   V    V    critical -
19 eqpt (10004)hw_mon_fail           local1   V    V    critical -

Press any key to continue, 'e' to exit, 'n' for nopause

```

## 44.2.5 Log Format

The following table describes the columns in the list.

**Table 99** Log Format

LABEL	DESCRIPTION
no	This is the index number of the alarm entry in this list display.
alarm	This is the category of alarms. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms.
condition	There is a condition code number for the specific alarm message and a text description for the condition under which the alarm applies.
facility	This is the log facility (local1~local7) on the syslog server where the system is to log this alarm. This is for alarms that send alarms to a syslog server.
snmp	This displays "V" if the system is to send this alarm to an SNMP server. It displays a dash (-) if the system does not send this alarm to an SNMP server.
syslog	This displays "V" if the system is to send this alarm to a syslog server. It displays a dash (-) if the system does not send this alarm to a syslog server.

**Table 99** Log Format (continued)

LABEL	DESCRIPTION
severity	This is the alarm severity level (critical, major, minor or info).
clearable	This displays “V” if the alarm clear command removes the alarm from the system. It displays a dash (-) if the alarm clear command does not remove the alarm from the system.

### 44.2.6 Alarm History Show Command Example

The following example displays the historic critical level alarms for all alarm categories, and all conditions.

ras> alarm history show critical all all all all rev detail					
no	alarm	condition	severity	timestamp	source
1	eqpt	+fan_err	critical	07/28 15:23:35	eqpt
		* IES-612-51:Fan 2 speed 0, low 2000, high 8000			
2	eqpt	+fan_err	critical	07/28 15:23:35	eqpt
		* IES-612-51:Fan 3 speed 0, low 2000, high 8000			
3	eqpt	+fan_err	critical	07/28 15:23:33	eqpt
		* IES-612-51:Fan 1 speed 0, low 2000, high 8000			

### 44.2.7 Alarm History Clear Command Example

The following example removes the historic minor level alarms for all alarm categories, and all conditions.

```
ras> alarm history clear minor
```

### 44.2.8 Alarm XEdit Command Example

The following example creates an alarm report entry that sets all system alarms to the major severity level and sends them to an SNMP server at the local 3 log facility.

```
ras> alarm xedit sys all major local3 syslog
```



## DHCP Commands

This chapter describes how to use the DHCP Relay and DHCP Snoop commands. Use these commands to configure the DHCP relay feature. See [Chapter 25 on page 187](#) for background information on DHCP relay.

### 45.1 General DHCP Command Parameters

The following table describes commonly used DHCP command parameter notation.

**Table 100** General DHCP Command Parameters

NOTATION	DESCRIPTION
<i>vid all</i>	The ID of the VLAN to which to apply the setting. Type <i>all</i> to apply the setting to all VLANs.
<i>port-list</i>	You can specify a single port (1), all ports (*) or a list of ports (1, 3). You can also include a range of ports (1, 5, 6~10).

### 45.2 DHCP Relay Commands

**Table 101** DHCP Relay Commands

COMMAND	DESCRIPTION	P
<code>switch dhcprelay show</code>	This command displays the DHCP relay settings for each VLAN. These settings include whether or not this feature is activated for each VLAN, the relay mode, the current list of DHCP servers, the status of the DHCP relay agent info option 82 feature and the information configured for it.	L/L
<code>switch dhcprelay enable &lt;vid all&gt;</code>	This command turns on the DHCP relay for the specified VLAN or for all VLANs.	M/H
<code>switch dhcprelay disable &lt;vid all&gt;</code>	This command turns off the DHCP relay for the specified VLAN or for all VLANs.	M/H

**Table 101** DHCP Relay Commands (continued)

COMMAND	DESCRIPTION	P
switch dhcprelay server set <vid> <primary-server> [secondary-server]	This command specifies the DHCP server(s) that serve the specified VLAN. The primary server is required; the secondary server is optional. The IES-612-51 routes DHCP requests to the specified DHCP server(s) according to the <i>relaymode</i> . Use VLAN ID 0 to set up the default DHCP server(s) for all non-listed VLAN. <i>vid</i> : The ID of the VLAN to which to apply the setting. <i>primary-server</i> : The IP address of one DHCP server. <i>secondary-server</i> : The IP address of a second DHCP server.	M/H
switch dhcprelay server delete <vid all> [primary-server]	This command deletes all information about DHCP servers for the specified VLAN or for all VLANs. Afterwards, the specified VLAN can use the default DHCP server(s) set up for VLAN ID 0, if any. <i>primary-server</i> : The IP address of one DHCP server.	M/H
switch dhcprelay server active <vid> <active-server>	If the <i>relaymode</i> is <i>auto</i> , this command specifies to which DHCP server (the primary one or the secondary one) the IES-612-51 should relay DHCP requests for the selected VLAN. This command has no effect if the <i>relaymode</i> is <i>both</i> . <i>active-server</i> : 1: The primary DHCP server is active. 2: The secondary DHCP server is active.	M/H
switch dhcprelay relaymode <vid all> <mode>	This command controls how the IES-612-51 routes DHCP requests. The IES-612-51 can route DHCP requests to the active DHCP server for the selected VLAN, or it can route DHCP requests to all DHCP servers set up for the selected VLAN. <i>mode</i> : Relay process mode; it controls to which DHCP server(s) the IES-612-51 relays DHCP requests for the specified VLAN or for all VLANs. <i>auto</i> - the IES-612-51 relays DHCP requests to the active server for the specified VLAN or for all VLANs. <i>both</i> - the IES-612-51 relays DHCP requests to the primary and secondary server for the specified VLAN or for all VLANs, regardless of which server is active.	M/H

## 45.2.1 Show Command Example

This example shows the current DHCP configuration of the IES-612-51.

```

ras> switch dhcprelay show

```

vid	enable	relay mode	primary-server	secondary-server
0	-	both	0.0.0.0	0.0.0.0
33	V	auto	(*)192.168.1.10	0.0.0.0

option82		option82	
vid	sub-opt1 info (Circuit ID)	sub-opt2 info (Remote ID)	
0	-	-	
33	- opt1	- opt2	

## 45.3 DHCP Relay Option 82 Sub-option 1 Commands

Use the following commands to configure the DHCP relay Option 82 (agent information) feature, sub-option 1 (circuit ID). This feature applies regardless of whether or not the DHCP relay is on.

**Table 102** DHCP Relay Option 82 Sub-option 1 Commands

COMMAND	DESCRIPTION	P
switch dhcprelay option82 enable <vid all>	This command turns on the DHCP relay agent information (Option 82 Sub-option 1) for the specified VLAN or for all VLANs.	M/H
switch dhcprelay option82 disable <vid all>	This command turns off the DHCP relay agent information (Option 82, Sub-option 1) for the specified VLAN or for all VLANs.	M/H
switch dhcprelay option82 set <vid all> <relay-info>	This command adds the specified information for the relay agent for the specified VLAN or for all VLANs.  <i>relay-info:</i> Up to 23 ASCII characters of additional information for the IES-612-51 to add to the DHCP requests that it relays to a DHCP server. Examples of information you could add would be the name of the IES-612-51 or the ISP. To clear this field, type a pair of double quotation marks with no space between them ("").	M/H

## 45.4 DHCP Relay Option 82 Sub-option 2 Commands

Use the following commands to configure the DHCP relay Option 82 (agent information) feature, sub-option 2 (remote ID). This feature applies regardless of whether or not the DHCP relay is on.

**Table 103** DHCP Relay Option 82 Sub-option 2 Commands

COMMAND	DESCRIPTION	P
<code>switch dhcprelay opt82sub2 enable &lt;vid all&gt;</code>	This command turns on the DHCP relay agent information (Option 82, Sub-option 2) for the specified VLAN or for all VLANs.	M/H
<code>switch dhcprelay opt82sub2 disable &lt;vid all&gt;</code>	This command turns off the DHCP relay agent information (Option 82, Sub-option 2) for the specified VLAN or for all VLANs.	M/H
<code>switch dhcprelay opt82sub2 set &lt;vid all&gt; &lt;relay-info&gt;</code>	This command adds the specified information for the relay agent (Option 82, Sub-option 2) for the specified VLAN or for all VLANs.  <i>relay-info</i> : Up to 23 ASCII characters of additional information for the IES-612-51 to add to the DHCP requests that it relays to a DHCP server. Examples of information you could add would be the name of the IES-612-51 or the ISP. To clear this field, type a pair of double quotation marks with no space between them ("").	M/H

## 45.5 DHCP Snoop Commands

Use these commands to configure or show DHCP snooping settings on the subscriber ports. The system gets the client MAC-IP address information (in the reply from a DHCP server) and stores it in the DHCP snooping table. The system forwards packets from only the clients whose MAC-IP address is in the DHCP snooping table. Packets from unknown IP address(es) are not forwarded (dropped). This feature prevents clients from assigning their own static IP addresses.

In some cases, you might want to allow packets from an IP address not offered by the DHCP server. This might apply, for example, to static IP addresses. In this case, you can specify the IP address whose packets are allowed, and the IES-612-51 forwards these packets as well.

**Table 104** DHCP Snoop Commands

COMMAND	DESCRIPTION	P
<code>switch dhcpsnoop enable &lt;port-list&gt;</code>	This command activates the DHCP snooping feature on the specified port(s).	M/H
<code>switch dhcpsnoop disable &lt;port-list&gt;</code>	This command disables the DHCP snooping feature on the specified port(s).	M/H
<code>switch dhcpsnoop flush &lt;port-list&gt;</code>	This command clears the DHCP snooping binding table on the specified port(s). The system also automatically clears the binding table when you disable DHCP snooping.	M/H
<code>switch dhcpsnoop show &lt;port-list&gt;</code>	Use this command to display the current DHCP snooping settings of the specified port(s).	L/L

**Table 104** DHCP Snoop Commands (continued)

COMMAND	DESCRIPTION	P
<code>statistics dhcp counter</code> [<port-list> [clear]]	Use this command to display or clear the summary of DHCP packets on the specified port(s).	L/L
<code>statistics dhcp snoop</code> <port-list>	Use this command to look at the DHCP snooping table on the specified port(s).	L/L

### 45.5.1 DHCP Snoop Enable Command Example

The following example enables DHCP snooping on port 1.

```
ras> switch dhcpsnoop enable 1
```

### 45.5.2 DHCP Snoop Show Command Example

The following example displays the settings of ports 1-5.

```
ras> switch dhcpsnoop show 1~5
port  enable
-----
  1    -
  2    -
  3    -
  4    -
  5    -
```

### 45.5.3 DHCP Counter Statistics Command Example

The following example displays the settings of port 1.

```
ras> statistics dhcp counter 1
port discover  offer   request   ack      overflow
-----
  1           0       0         0        0         0
```

Each field is described in the following table.

port	=	The selected ADSL port number(s).
discover	=	The number of DHCP Discover packets on this port.
offer	=	The number of DHCP Offer packets on this port.
request	=	The number of DHCP Request packets on this port.
ack	=	The number of DHCP Ack packets on this port.
overflow	=	There is a limit to the number of IP addresses the DHCP server can assign at one time to each port. This field displays the number of requests from DHCP clients above this limit. Overflow requests are dropped by the IES-612-51.

### 45.5.4 DHCP Snoop Statistics Command Example

The following example displays the settings of port 1.

**Figure 135** DHCP Snoop Statistics Command Example

```
ras> statistics dhcp snoop 1
port overflow      mac                ip
-----
```

Each field is described in the following table.

port	=	The selected ADSL port number(s).
overflow	=	There is a limit to the number of IP addresses the DHCP server can assign at one time to each port. This field displays the number of requests from DHCP clients above this limit. Overflow requests are dropped by the IES-612-51.
mac	=	The MAC address of a client on this port to which the DHCP server assigned an IP address.
ip	=	The IP address assigned to a client on this port.

# IEEE 802.1Q Tagged VLAN and Isolation Commands

This chapter describes the IEEE 802.1Q Tagged VLAN commands as well as command used to configure the isolation feature on the IES-612-51.

## 46.1 IEEE 802.1Q Tagging Types

There are two kinds of tagging:

- Explicit Tagging

A VLAN identifier is added to the frame header that identifies the source VLAN.

- Implicit Tagging

The MAC (Media Access Control) number, the port or other information is used to identify the source of a VLAN frame.

The IEEE 802.1Q Tagged VLAN uses both explicit and implicit tagging.

It is important for the IES-612-51 to determine what devices are VLAN-aware and VLAN-unaware so that it can decide whether to forward a tagged frame (to a VLAN-aware device) or first strip the tag from a frame and then forward it (to a VLAN-unaware device).

## 46.2 Filtering Databases

A filtering database stores and organizes VLAN registration information useful for switching frames to and from the IES-612-51. A filtering database consists of static entries (Static VLAN or SVLAN table).

### 46.2.1 Static Entries (SVLAN Table)

Static entry registration information is added, modified and removed by administrators only.

## 46.3 IEEE VLAN1Q Tagged VLAN Configuration Commands

These switch commands allow you to configure and monitor the IEEE 802.1Q Tagged VLAN.

**Table 105** IEEE VLAN1Q Tagged VLAN Configuration Command Summary

COMMAND	DESCRIPTION	P
<code>switch vlan portshow [portlist]</code>	Displays the port's IEEE 802.1Q VLAN tag settings.	M/L
<code>switch vlan pvid &lt;portlist&gt; &lt;pvid&gt;</code>	Sets a default VLAN ID for all untagged packets that come in through the specified port. <i>portlist</i> : You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>. <i>pvid</i> : The VLAN ID. Valid parameter range = [1 – 4094].	H/H
<code>switch vlan priority &lt;portlist&gt; &lt;priority&gt;</code>	Sets the priority of incoming frames with an IEEE 802.1Q VLAN tag. <i>priority</i> : This is the priority value (0 to 7) to use for incoming frames with an IEEE 802.1Q VLAN tag.	H/H
<code>switch vlan set &lt;vid&gt; &lt;portlist&gt;:&lt;F&lt;T U&gt; X N&gt; [&lt;portlist&gt;:&lt;F&lt;T U&gt; X&gt; ...] [name]</code>	Adds or modifies an entry in the static VLAN table. <i>vid</i> : The VLAN ID [1 – 4094]. <i>portlist</i> : You can specify a single port: <1>, all ports: <*>, a list of ports: <1,3,enet1>, you can also include a range of ports: <1,5,6~10,enet1,enet2>. F<T U>: The <F> stands for a fixed registrar administration control flag and registers a <portlist> to the static VLAN table with <vid>. For a fixed port, you also have to specify <T U>, the tag control flag. T: has the device add an IEEE 802.1Q tag to frames going out through this port(s). U: has the device send frames out through this port(s) without an IEEE 802.1Q tag. X: This is the registrar administration control flag. X stands for forbidden and blocks a <portlist> from joining the static VLAN table with <vid>. N: stands for normal and confirms registration of the <portlist> to the static VLAN table with <vid>. This is used in GVRP applications. <i>name</i> : A name to identify the SVLAN entry.	H/H
<code>switch vlan frametype &lt;portlist&gt; &lt;all tag&gt;</code>	Sets the specified xDSL ports to accept VLAN tagged Ethernet frames, or both tagged and untagged Ethernet frames.	H/H
<code>switch vlan cpu show</code>	Displays the management VLAN (CPU). You can only use ports that are members of this management VLAN in order to manage the IES-612-51.	M/~



**Table 105** IEEE VLAN1Q Tagged VLAN Configuration Command Summary (continued)

COMMAND	DESCRIPTION	P
<code>switch vlan cpu set &lt;vid&gt;</code>	Sets the management VLAN (CPU). You can only use ports that are members of this management VLAN in order to manage the IES-612-51.	H/~
<code>switch vlan delete &lt;vlan-list&gt;</code>	Deletes the specified VLAN ID entry from the static VLAN table. <i>vlan-list</i> : You can specify a single VID: <1>, all VIDs: <*>, a list of VIDs: <1,3>, you can also include a range of VIDs: <1,5,6~10>.	H/H
<code>switch vlan enable &lt;vid&gt;</code>	This command enables the specified VLAN ID in the SVLAN (Static VLAN) table.	H/H
<code>switch vlan disable &lt;vid&gt;</code>	This command disables the specified VLAN ID in the SVLAN (Static VLAN) table.	H/H
<code>switch vlan show &lt;vlanlist&gt;</code>	This command shows information about the specified port's VLAN settings.	M/L
<code>switch vlan gvrp &lt;portlist&gt; &lt;enable disable&gt;</code>	Set the port(s) to enable or disable GVRP.	H/H

### 46.3.1 VLAN Port Show Command Example

The following example shows the settings for xDSL port 1.

```

ras> switch vlan portshow 3
  port pvid priority frametype gvrp
-----
   3    1         0         all
ras>

```

### 46.3.2 VLAN PVID Command Example

The following example sets the default VID of port 1 to 200.

```

ras> switch vlan pvid 1 200

```

### 46.3.3 VLAN Priority Command Example

The following example sets a priority of three for frames (with an IEEE 802.1Q VLAN tag) that come in on xDSL port 2.

```

ras> switch vlan priority 2 3

```

## 46.3.4 VLAN Set Command Examples

This command adds or modifies an entry in the static VLAN table. Use the `switch vlan show` command to display your configuration. An example of a configuration is shown next.

### 46.3.4.1 Modify a Static VLAN Table Example

The following is an example of how to modify a static VLAN table.

```
ras> switch vlan set 2000 1:FU
ras> switch vlan set 2001 2:FU
```

### 46.3.4.2 Forwarding Process Example

Tagged Frames

- 1 First the IES-612-51 checks the VLAN ID (VID) of tagged frames or assigns temporary VIDs to untagged frames (see [Section 46.3.2 on page 289](#)).
- 2 The IES-612-51 checks the frame's source MAC address against the MAC filter.
- 3 The IES-612-51 then checks the VID in a frame's tag against the SVLAN table.
- 4 The IES-612-51 notes what the SVLAN table says (that is, the SVLAN tells the IES-612-51 whether or not to forward a frame and if the forwarded frames should have a tag).
- 5 Frames might be dropped if they are sent to a CPE (customer premises equipment) xDSL device that does not accept tagged frames.

Untagged Frames

- 1 An untagged frame comes in from the LAN.
- 2 The IES-612-51 checks the frame's source MAC address against the MAC filter.
- 3 The IES-612-51 checks the PVID table and assigns a VID and IEEE 802.1Q priority.
- 4 The IES-612-51 ignores the port from which the frame came, because the IES-612-51 does not send a frame to the port from which it came. The IES-612-51 also does not forward frames to "forbidden" ports.
- 5 If after looking at the SVLAN, the IES-612-51 does not have any ports to which it will send the frame, it drops the frame.

## 46.3.5 VLAN Frame Type Command Example

The following example sets the IES-612-51 to accept only VLAN tagged Ethernet frames on xDSL port 3.

```
ras> switch vlan frametype 3 tag
```

## 46.3.6 VLAN CPU Show Command Example

The following example sets VLAN ID 2 to be the CPU (management) VLAN.

```
ras> switch vlan cpu set 2
```

### 46.3.7 VLAN CPU Set Command Example

The following example sets VLAN ID 2 to be the CPU (management) VLAN.

```
ras> switch vlan cpu set 2
```

### 46.3.8 Configuring Management VLAN Example



After the following example configuration, you must connect to the first Ethernet port through a VLAN aware device that is using the proper VLAN ID in order to perform management.

By default, the IES-612-51's xDSL ports are members of the management VLAN (VID 1). The following procedure shows you how to configure a tagged VLAN that limits management access to just one Ethernet port.



Use the console port to configure the IES-612-51 if you misconfigure the management VLAN and lock yourself out.

- 1 Use the `switch vlan set` command to configure a VLAN ID (VID 3 in this example) for managing the IES-612-51 (the “management” or “CPU” VLAN).

```
ras> switch vlan set 3 enet1:FT
```

- 2 Use the `switch vlan1q vlan cpu` command to set VID 3 as the management VLAN.

```
ras> switch vlan cpu set 3
```

### 46.3.9 VLAN Delete Command Example

The following example deletes entry 2 in the static VLAN table.

```
ras> switch vlan delete 2
```

### 46.3.10 VLAN Show Command Example

The following example shows the settings for all VLANs.

```

ras> switch vlan show *
vid name          F:fixed X:forbidden N:normal    U:untag T:tag
-----
 1 -
   enabled        12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU
 2 -
   disabled       12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU
2000 -
   enabled        12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU

```

## 46.4 VLAN Statistics Commands

VLAN statistics provide information about VLANs configured on the IES-612-51.

**Table 106** Statistics VLAN Command Summary

COMMAND	DESCRIPTION	P
statistics vlan	Displays current VLAN settings.	M/L

## 46.5 GARP Timer Commands

These switch commands allow you to configure GARP (Generic Attribute Registration Protocol) Timer settings. GARP Timers set declaration (Join, Leave and Leave All) timeout values with respect to GVRP (GARP VLAN Registration Protocol).

**Table 107** GARP Timer Command Summary

COMMAND	DESCRIPTION	P
switch garptimer join <milliseconds>	Sets the system's garp join time.	H/H
switch garptimer leave <milliseconds>	Sets the system's garp leave time.	H/H
switch garptimer leaveall <milliseconds>	Sets the system's garp leaveall time.	H/H
switch garptimer show <milliseconds>	Displays the system's garp settings.	M/L

## 46.6 Isolation Commands

Use the switch isolation commands to configure the subscriber isolation feature. Use subscriber isolation to block communications between subscriber ports. When you enable subscriber isolation you do not need to configure the VLAN to isolate subscribers.

Turn on VLAN isolation to block communications between subscribers in different VLANs if you do not block communications between subscriber ports. See [Chapter 42 on page 263](#) for examples.

**Table 108** Isolation Command Summary

COMMAND	DESCRIPTION	P
<code>switch isolation daisychain</code>	Sets switch mode to daisychain mode.	H/H
<code>switch isolation disable</code>	Turns the subscriber isolation feature off.	H/H
<code>switch isolation enable</code>	Turns the subscriber isolation feature on.	H/H
<code>switch isolation show</code>	Displays the subscriber isolation feature's current settings.	M/L
<code>switch isolation standalone</code>	Sets switch mode to standalone mode.	H/H



# MAC Commands

This chapter describes how to configure the IES-612-51's MAC commands.

## 47.1 MAC Filter Commands

Use the MAC filter to control from which MAC (Media Access Control) addresses frames can (or cannot) come in through a port.

**Table 109** MAC Filter Command Summary

COMMAND	DESCRIPTION	P
<code>switch mac filter show [portlist]</code>	Displays the MAC filtering status (V for enabled, - for disabled) and the fixed source MAC addresses on the specified xDSL port(s) or on all xDSL ports if no port is specified.	M/L
<code>switch mac filter enable [portlist]</code>	Turns on the MAC filtering feature on the specified xDSL port(s) or on all xDSL ports if no port is specified.	H/H
<code>switch mac filter disable [portlist]</code>	Turns off the MAC filtering feature on the specified xDSL port(s) or on all xDSL ports if no port is specified.	H/H
<code>switch mac filter mode &lt;port&gt; &lt;accept deny&gt;</code>	Sets whether the IES-612-51 allows or blocks access for the MAC addresses you specify.	H/H
<code>switch mac filter set &lt;port&gt; &lt;mac&gt; [mac] [mac]...</code>	Adds an allowed source MAC address on the specified xDSL port. <i>mac</i> : The source MAC address in "00:a0:c5:12:34:56" format.	H/H
<code>switch mac filter delete &lt;port&gt; &lt;mac&gt; [mac] [mac] ...</code>	Removes a configured source MAC address from the xDSL port that you specify. <i>mac</i> : The source MAC address in "00:a0:c5:12:34:56" format.	H/H
<code>statistics mac</code>	Displays current MAC address forwarding table.	M/L

### 47.1.1 MAC Filter Show Command Example

The following example displays the MAC filtering mode, status and the fixed source MAC addresses on xDSL port 5.

```
ras> switch mac filter show 5
      status:V, enable mac filter function.
      status:-, disable mac filter function.
port  mode   status mac
----  -
  5  accept   -    00:00:05:12:34:56
```

### 47.1.2 MAC Filter Enable Command Example

The following example turns on the MAC filtering feature on xDSL port 5.

```
ras> switch mac filter enable 5
```

### 47.1.3 MAC Filter Disable Command Example

The following example turns off the MAC filtering feature on xDSL port 5.

```
ras> switch mac filter disable 5
```

### 47.1.4 MAC Filter Mode Command Example

The following example sets xDSL port 5 to allow frames from the MAC addresses specified for xDSL port 5.

```
ras> switch mac filter mode 5 accept
```

### 47.1.5 MAC Filter Set Command Example

The following example adds source MAC address 00:a0:c5:12:34:56 for xDSL port 5.

```
ras> switch mac filter set 5 00:00:05:12:34:56
```

### 47.1.6 MAC Filter Delete Command Example

The following example removes the source MAC address of 00:a0:c5:12:34:56 from the MAC filter for xDSL port 5.

```
ras> switch mac filter delete 5 00:00:05:12:34:56
```



## 47.2 MAC Count Commands

Use MAC count commands to limit how many MAC addresses may be dynamically learned. MAC count commands are listed next. When the MAC filter accept mode is enabled (see [Section 47.1 on page 295](#)), the IES-612-51 ignores the MAC count setting and accepts all of the MAC addresses listed for the port in the MAC filter settings.

**Table 110** MAC Count Command Summary

COMMAND	DESCRIPTION	P
<code>switch mac count show [portlist]</code>	Displays the MAC count settings on the specified xDSL port(s) or on all xDSL ports if no port is specified.	M/L
<code>switch mac count enable &lt;portlist&gt;</code>	Enables the MAC count filter on the specified xDSL port(s). When the MAC filter accept mode is enabled (see <a href="#">Section 47.1 on page 295</a> ), the IES-612-51 ignores the MAC count setting and accepts all of the MAC addresses listed for the port in the MAC filter settings.	H/H
<code>switch mac count disable &lt;portlist&gt;</code>	Disables the MAC filtering feature on the specified xDSL port(s).	H/H
<code>switch mac flush</code>	Clears learned MAC addresses from the forwarding table.	H/H
<code>switch mac count set &lt;portlist&gt; &lt;count&gt;</code>	Sets the limit for how many MAC addresses may be dynamically learned on the specified xDSL port(s). <i>count</i> : The valid range is from "1" to "128".	H/H
<code>switch mac agingtime set &lt;10~10000 0:disabled&gt;</code>	Sets the MAC aging out time period.	H/H
<code>switch mac agingtime show</code>	Displays the MAC aging out time period.	M/L

### 47.2.1 MAC Count Show Command Example

The following example displays the MAC count settings for xDSL port 4.

```

ras> switch mac count show 4
port status count
----
4      V      128

```

### 47.2.2 MAC Count Enable Command Example

The following example turns on the MAC count filter on xDSL port 4.

```

ras> switch mac count enable 4

```

### 47.2.3 MAC Count Disable Command Example

The following example turns off the MAC count filter on xDSL port 4.

```
ras> switch mac count disable 4
```

### 47.2.4 MAC Count Set Command Example

The following example sets the MAC count filter to allow up to 50 MAC addresses to be dynamically learned on xDSL port 7.

```
ras> switch mac count set 7 50
```

## 47.3 MAC Anti-Spoofing Commands

Use MAC anti-spoofing commands to configure checking for authorized MAC to IP address bindings for incoming packets on the IES-612-51.

**Table 111** MAC Anti-Spoofing Command Summary

COMMAND	DESCRIPTION	P
switch mac antispoofing disable	Turns off the MAC antispoofing.	H/H
switch mac antispoofing enable	Turns on the MAC antispoofing.	H/H
switch mac antispoofing show	Shows the MAC antispoofing status.	M/L

# IGMP Commands

This chapter describes the IGMP snooping and filtering commands.

## 48.1 IGMP Snooping Commands

Use the IGMP snoop commands to enable or disable IGMP proxy or IGMP snooping.

**Table 112** igmpsnoop Command Summary

COMMAND	DESCRIPTION	P
switch igmpsnoop show	Displays the IGMP mode (proxy, snooping or disabled).	M/L
switch igmpsnoop enable <proxy snooping> [v2 v3]	Turns on IGMP proxy or snooping and, optionally, specifies the IGMP version.  Use proxy to have the device use IGMP proxy. Use snooping to have the device passively learn multicast groups.  If you select IGMPv2 (v2), the device discards IGMPv3 packets. This provides better security if none of the devices in the network use IGMPv3. If you select IGMPv3 (v3), the device recognizes both IGMPv2 and IGMPv3.	H/H
switch igmpsnoop disable	Turns off IGMP proxy or snooping.	H/H

### 48.1.1 IGMP Snoop Show Example

The following example displays the IGMP mode (proxy, snooping or disabled).

```

ras> switch igmpsnoop show
IGMP Snooping/Proxy is Disable

```

### 48.1.2 IGMP Snoop Enable Example

The following example sets the device to use IGMP proxy.

```

ras> switch igmpsnoop enable proxy

```

### 48.1.3 IGMP Snoop Disable Command Example

The following example sets the device to not use IGMP proxy or snooping.

```

ras> switch igmpsnoop disable

```

## 48.2 IGMP Filter Commands

Use the IGMP filter commands to define IGMP filter profiles and assign them to xDSL ports.

IGMP filter profiles allow you to control access to IGMP multicast groups. You can have a service available to a specific IGMP multicast group. You can configure an IGMP filter profile for an IGMP multicast group that has access to a service (like a SIP server for example). Then you can assign the IGMP filter profile to xDSL ports that are allowed to use the service.

**Table 113** igmpfilter Command Summary

COMMAND	DESCRIPTION	P
switch igmpfilter show [ <i>portlist</i> ]	Displays which IGMP filter profile an xDSL port(s) is using. <i>portlist</i> : You can specify a single xDSL port <1>, all xDSL ports <*> or a list of xDSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.	M/L
switch igmpfilter set [ <i>&lt;port&gt; *</i> ] <i>&lt;name&gt;</i>	Sets an xDSL port(s) to use an IGMP filter profile. <i>port *</i> : You can specify a single xDSL port, for example 1 or all xDSL ports *. <i>name</i> : The name of an IGMP filter profile.	H/H
switch igmpfilter profile set <i>&lt;name&gt; &lt;index&gt; &lt;startip&gt; &lt;endip&gt;</i>	Configures an IGMP filter profile. <i>name</i> : Specify a name to identify the IGMP filter profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed. <i>index</i> : The number (1~16) to identify a multicast IP address range. <i>startip</i> : Type the starting multicast IP address for a range of multicast IP addresses that you want to belong to the IGMP filter profile. <i>endip</i> : Type the ending multicast IP address for a range of IP addresses that you want to belong to the IGMP filter profile. If you want to add a single multicast IP address, enter it in both the <i>startip</i> and <i>endip</i> fields.	H/H
switch igmpfilter profile delete <i>&lt;name&gt;</i>	Removes the specified IGMP filter profile.	H/H
switch igmpfilter profile show [ <i>&lt;name&gt; *</i> ]	Displays an IGMP filter profile's settings.	M/L

### 48.2.1 IGMP Filter Show Command Example

The following example displays which IGMP filter profile xDSL port 9 is using.

```

ras> switch igmpfilter show 9
port                               profile
-----
  9                               DEFVAL

```

### 48.2.2 IGMP Filter Set Command Example

The following example sets xDSL port 9 to use the voice IGMP filter profile.

```

ras> switch igmpfilter set 9 voice

```

### 48.2.3 IGMP Filter Profile Set Command Example

The following example configures an IGMP filter profile named **voice** with a range of multicast IP addresses (index 1) from 224.1.1.10 to 224.1.1.44.

```
ras> switch igmpfilter profile set voice 1 224.1.1.10 224.1.1.44
```

### 48.2.4 IGMP Filter Profile Delete Command Example

The following example removes the **voice** IGMP filter profile.

```
ras> switch igmpfilter profile delete voice
```

### 48.2.5 IGMP Filter Profile Show Command Example

The following example displays the **voice** IGMP filter profile's settings.

```
ras> switch igmpfilter profile show voice
```

profile	index	startip	endip
voice	1	224.1.1.10	224.1.1.44
voice	2	0.0.0.0	0.0.0.0
voice	3	0.0.0.0	0.0.0.0
voice	4	0.0.0.0	0.0.0.0
voice	5	0.0.0.0	0.0.0.0
voice	6	0.0.0.0	0.0.0.0
voice	7	0.0.0.0	0.0.0.0
voice	8	0.0.0.0	0.0.0.0
voice	9	0.0.0.0	0.0.0.0
voice	10	0.0.0.0	0.0.0.0
voice	11	0.0.0.0	0.0.0.0
voice	12	0.0.0.0	0.0.0.0
voice	13	0.0.0.0	0.0.0.0
voice	14	0.0.0.0	0.0.0.0
voice	15	0.0.0.0	0.0.0.0
voice	16	0.0.0.0	0.0.0.0

## 48.3 IGMP Bandwidth Commands

Use the IGMP bandwidth commands to set up bandwidth budgets for specific multicast channels.

**Table 114** IGMP Bandwidth Command Summary

COMMAND	DESCRIPTION	P
switch igmpsnoop bandwidth default <rate>	Sets the default bandwidth for multicast channels for which you have not configured bandwidth requirements yet. Multicast bandwidth settings on channels (using the <code>switch igmpsnoop bandwidth set</code> command) have higher priority over this default setting. <i>rate</i> : Allowed bandwidth between 1 and 1000 000 kbps (kilo bits per second).	H/H

**Table 114** IGMP Bandwidth Command Summary (continued)

COMMAND	DESCRIPTION	P
<code>switch igmpsnoop bandwidth set &lt;index&gt; &lt;start-mcast-ip&gt; &lt;end-mcast-ip&gt; &lt;rate&gt;</code>	Configures bandwidth allocation for the multicast channel(s). For multicast channel(s) for which you have not configured bandwidth settings, the default multicast bandwidth setting applies (see the <code>switch igmpsnoop bandwidth default</code> command). <i>index</i> : 1~96; a unique number for this setting. <i>start-mcast-ip</i> : 224.0.0.0~239.255.255.255; the beginning of the multicast range. <i>end-mcast-ip</i> : 224.0.0.0~239.255.255.255; the end of the multicast range. It must be greater than <start-mcast-ip>. <i>rate</i> : 1~100000, in units of kbps	H/H
<code>switch igmpsnoop bandwidth delete &lt;index&gt;</code>	Removes the specified multicast bandwidth configuration profile.	H/H
<code>switch igmpsnoop bandwidth show</code>	Displays bandwidth budget for multicast IP channels configured on the IES-612-51.	M/L

## 48.4 IGMP Bandwidth Port Commands

Use the IGMP bandwidth port commands to set up bandwidth budgets for multicast traffic on specific ports.

**Table 115** IGMP Bandwidth Port Command Summary

COMMAND	DESCRIPTION	P
<code>switch igmpsnoop bandwidth port disable &lt;portlist&gt;</code>	Deactivates multicast bandwidth settings of the specified port. <i>portlist</i> : You can specify a single xDSL port <1>, all xDSL ports <*> or a list of xDSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.	H/H
<code>switch igmpsnoop bandwidth port enable &lt;portlist&gt;</code>	Activates multicast bandwidth setting on the specified port.	H/H
<code>switch igmpsnoop bandwidth port set &lt;portlist&gt; &lt;rate&gt;</code>	Sets the bandwidth allowed for multicast traffic on the specified port(s). It does not automatically enable it, however. <i>rate</i> : 1~100000, in units of kbps	H/H
<code>switch igmpsnoop bandwidth port show &lt;portlist&gt;</code>	Displays the multicast bandwidth setting on the specified port(s) and whether or not this setting is active. The following example displays the bandwidth budget for port 1.	M/L

### 48.4.1 IGMP Bandwidth Port Show Command Example

The following example displays the bandwidth budget for port 1.

```

ras> switch igmpsnoop bandwidth port show 1
port enable bandwidth
-----
1      -      4096

```

## 48.5 IGMP Count Limit Commands

Use these commands to limit the number of IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

IGMP count is useful for ensuring the service quality of high bandwidth services like video or Internet Protocol television (IPTV). IGMP count can limit how many channels (IGMP groups) the subscriber connected to an xDSL port can use at a time. If each channel requires 4~5 Mbps of download bandwidth, and the subscriber's connection supports 11 Mbps, you can use IGMP count to limit the subscriber to using just 2 channels at a time. This also effectively limits the subscriber to using only two IPTVs with the xDSL connection.

**Table 116** IGMP Count Limit Command Summary

COMMAND	DESCRIPTION	P
<code>switch igmpsnoop igmpcount disable &lt;portlist&gt;</code>	Turns off the IGMP count limit for the specified xDSL port(s).	H/H
<code>switch igmpsnoop igmpcount enable &lt;portlist&gt;</code>	Turns on the IGMP count limit for the specified xDSL port(s).	H/H
<code>switch igmpsnoop igmpcount set &lt;portlist&gt; &lt;count&gt;</code>	Sets the IGMP count limit for the specified xDSL port(s). <i>count</i> : 0~16; the maximum number of IGMP groups subscribers on the specified port(s) can join.	H/H
<code>switch igmpsnoop igmpcount show [portlist]</code>	Displays the IGMP count limit setting status for the specified xDSL port(s).	M/L

### 48.5.1 IGMP Count Disable Command Example

The following command turns off the IGMP count limit for port 4.

```
ras> switch igmpsnoop igmpcount disable 4
```

### 48.5.2 IGMP Count Enable Command Example

The following command turns on the IGMP count limit for port 4.

```
ras> switch igmpsnoop igmpcount enable 4
```

### 48.5.3 IGMP Count Set Command Example

The following command sets a IGMP count limit of 2 for port 4.

```
ras> switch igmpsnoop igmpcount set 4 2
```

### 48.5.4 IGMP Count Show Command Example

The following example displays the IGMP count limit settings for ports 1-5.

```

ras> switch igmpsnoop igmpcount show 1~5
port enable count
----
1      -      5
2      -      5
3      -      5
4      -      5
5      -      5

```

## 48.6 IGMP Snoop Statistics Commands

Use the IGMP Snoop Statistics commands to display current IGMP settings and statistics.

**Table 117** IGMP Snooping Statistics Command Summary

COMMAND	DESCRIPTION	P
statistics igmpsnoop info [clear]	Displays the current IGMP settings and the number of IGMP-related packets received. Optionally, clears the statistics.	L/L
statistics igmpsnoop group [<vid> [<mcast_ip>]]	Displays the information about IGMP groups learned on the system, specified VLAN, or specified multicast address on the specified VLAN(s). <i>vid</i> : The VLAN ID [1 – 4094]. <i>mcast-ip</i> : The multicast IP address.	L/L
statistics igmpsnoop port info <portlist>	Displays the number of IGMP-related packets received on the specified port(s).	L/L
statistics igmpsnoop port group <portlist>	Displays the IGMP groups a port joins.	M/L

### 48.6.1 IGMP Snoop Info Statistics Command Example

This command displays the current IGMP settings and the number of IGMP-related packets received.

```

ras> statistics igmpsnoop info
IGMP Snooping is Enable
number of query      = 0
number of report     = 0
number of leave      = 0
number of groups     = 0

```



### 48.6.2 IGMP Group Statistics Command Example

This command displays the information about IGMP groups learned on the system, specified VLAN, or specified multicast address on the specified VLAN(s).

```

ras> statistics igmpsnoop group
[group info]
group          vid port
-----

```

### 48.6.3 IGMP Port Info Statistics Command Example

The following figure shows the number of IGMP packets for port 1.

```

ras> statistics igmpsnoop port info 1
port  group_cnt query_cnt  join_cnt leave_cnt
-----
1          0          0      0          0

```

### 48.6.4 IGMP Port Group Statistics Command Example

The following figure shows an example for port 1.

```

ras> statistics igmpsnoop port group 1
port  vid mcast_ip      source ip
-----

```

## 48.7 Multicast VLAN Commands

Use these commands to configure VLAN multicast settings and set multicast port members.

Multicast VLAN allows one single multicast VLAN to be shared among different subscriber VLANs on the network. This improves bandwidth utilization by reducing multicast traffic in the subscriber VLANs and simplifies multicast group management.

**Table 118** Multicast VLAN Command Summary

COMMAND	DESCRIPTION	P
<pre>switch igmpsnoop mvlan set &lt;vid&gt; &lt;portlist&gt;:&lt;F&lt;T U&gt; X&gt; [&lt;portlist&gt;:&lt;F&lt;T U&gt; X&gt; ...] [name]</pre>	<p>Creates a multicast VLAN and sets the allowed/ blocked port member(s). This command is similar to the command to create a regular VLAN. See <a href="#">Section 46.3.4 on page 290</a> for examples and more information.</p> <p><i>portlist</i>: You can specify a single port ("1"), all ports ("*"), a list of ports ("1,3,enet1"), you can also include a range of ports ("1,5,6~10,enet1,enet2").</p> <p>F&lt;T U&gt;: Stands for a fixed registrar administration control flag and registers a &lt;portlist&gt; to the static VLAN table with &lt;vid&gt;. For a fixed port, you also have to specify &lt;T U&gt;, the tag control flag.</p> <p>T: has the device add an IEEE 802.1Q tag to frames going out through this port(s).</p> <p>U: has the device send frames out through this port(s) without an IEEE 802.1Q tag.</p> <p>X: This is the registrar administration control flag. It stands for forbidden and blocks a &lt;portlist&gt; from joining the static VLAN table with &lt;vid&gt;.</p> <p><i>name</i>: A name to identify the SVLAN entry.</p>	H/H
<pre>switch igmpsnoop mvlan delete &lt;vlan- list&gt;</pre>	<p>Removes the specified multicast VLAN configuration(s).</p> <p><i>vlan-list</i>: You can specify a single VLAN: &lt;1&gt;, all VLAN: &lt;*&gt;, a list of VLAN: &lt;1,3&gt;, you can also include a range of VLAN: &lt;1,5,6~10&gt;.</p>	H/H
<pre>switch igmpsnoop mvlan disable &lt;vid&gt;</pre>	Deactivates the specified multicast VLAN.	H/H
<pre>switch igmpsnoop mvlan enable &lt;vid&gt;</pre>	Activates the specified multicast VLAN.	H/H
<pre>switch igmpsnoop mvlan show &lt;vlan-list&gt;</pre>	Displays the current multicast VLAN settings.	H/H
<pre>switch igmpsnoop mvlan group set &lt;vid&gt; &lt;index&gt; &lt;start-mcast-ip&gt; &lt;end-mcast- ip&gt;</pre>	<p>Creates a multicast VLAN group.</p> <p><i>index</i>: 1~16; a unique number for this setting.</p> <p><i>start-mcast-ip</i>: Start of the multicast IP address range.</p> <p><i>end-mcast-ip</i>: End of the multicast IP address range.</p>	H/H
<pre>switch igmpsnoop mvlan group delete &lt;vid&gt; &lt;index&gt;</pre>	<p>Removes the specified multicast VLAN group setting.</p> <p><i>index</i>: 1~16; a unique number for this setting.</p>	H/H
<pre>switch igmpsnoop mvlan group show [&lt;vid&gt;]</pre>	Displays a multicast to VLAN translation entry.	H/H

### 48.7.1 Multicast VLAN Disable Command Example

The following example disables multicast VLAN 12.

```
ras> switch igmpsnoop mvlan disable 12
```

## 48.7.2 Multicast VLAN Show Command Example

This command displays the current multicast VLAN settings for VLAN 1. In the state column, “-” indicates the multicast VLAN is not active while “V” indicates the multicast VLAN is active.

```
ras> switch igmpsnoop mvlan show 1
vid name          F:fixed X:forbidden   U:untag T:tag
-----
```

## 48.7.3 Multicast VLAN Group Set Command Example

The following example creates a multicast VLAN with VID 10 and group index 1. The multicast address range is 224.224.224.1 ~ 224.224.224.10.

```
ras> switch igmpsnoop mvlan group set 10 1 224.224.224.1
224.224.224.10
```



# Packet Filter Commands

Use the following packet filter commands to filter out specific types of packets on specific ports.

## 49.1 Command Summary

The following section lists the commands for this feature.

**Table 119** pktfilter Command Summary

COMMAND	DESCRIPTION	P
<code>switch pktfilter show [portlist]</code>	Displays the packet type filter settings on the specified xDSL port(s) or on all xDSL ports if no port is specified. <i>portlist</i> : You can specify a single xDSL port <1>, all xDSL ports <*> or a list of xDSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.	M/L

**Table 119** pktfilter Command Summary (continued)

COMMAND	DESCRIPTION	P
switch pktfilter set <portlist> [filter]	<p>Sets the packet type filter for the specified xDSL port(s).  <i>filter</i>: Select the filter(s) separated by a space from the following choices:</p> <ul style="list-style-type: none"> <li>• <i>pppoe</i>: Reject PPPoE packets. (Point-to-Point Protocol over Ethernet) relies on PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single xDSL line, wireless device or cable modem.</li> <li>• <i>ip</i>: Reject IP packets. Internet Protocol. The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.</li> <li>• <i>arp</i>: Reject ARP packets. Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network.</li> <li>• <i>netbios</i>: Reject NetBIOS packets. (Network Basic Input/Output System) are TCP or UDP packets that enable a computer to connect to and communicate with a LAN.</li> <li>• <i>dhcp</i>: Reject DHCP packets. Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses, for a period of time, which means that past addresses are “recycled” and made available for future reassignment to other systems.</li> <li>• <i>eapol</i>: Reject EAPoL packets. EAP (Extensible Authentication Protocol, RFC 2486) over LAN. EAP is used with IEEE 802.1x to allow additional authentication methods (besides RADIUS) to be deployed with no changes to the access point or the wireless clients.</li> <li>• <i>igmp</i>: Reject IGMP packets. Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.</li> <li>• <i>none</i>: Accept all packets.</li> </ul>	H/H
switch pktfilter pppoeonly <portlist>	Sets the IES-612-51 to allow only PPPoE traffic on the specified xDSL port(s). The system will drop any non-PPPoE packets.	H/H

### 49.1.1 Packet Filter Show Command Example

The following example displays the packet type filter settings for xDSL ports 1 and 2. “V” displays for the packet types that the IES-612-51 is to accept on the port. “-” displays for packet types that the IES-612-51 is to reject on the port (packet types that are not listed are accepted). When you use PPPoE only, “#” appears for all of the packet types. With PPPoE only, the IES-612-51 rejects all packet types except for PPPoE (packet types that are not listed are also rejected).

```

ras> switch pktfilter show 9
V: pass through, -: filter out, #:Don't care
E: Enable, D: Disable
port pppoe ip arp netbios dhcp eapol igmp | PPPoE-Only
  1   #   #   #       #       #   #   |   E
  2   -   V   V       -       V       V   V   |   D

```

### 49.1.2 Packet Filter Set Command Example

The following example sets xDSL port 9 to reject ARP, PPPoE and IGMP packets.

```
ras> switch pktfilter set 9 arp pppoe igmp
```

### 49.1.3 Packet Filter PPPoE Only Command Example

The following example sets xDSL port 1 to accept only PPPoE packets.

```
ras> switch pktfilter pppoeonly 1
```





# Switch and Statistics Commands

This chapter describes the `switch` and `statistics` commands not discussed elsewhere in this guide.

## 50.1 IEEE 802.1x Commands

The following table describes the `dot1x` commands. Use these commands to configure port authentication on the IES-612-51.

**Table 120** IEEE 802.1x Commands

COMMAND	DESCRIPTION	P
<code>switch dot1x auth &lt;profile radius&gt;</code>	Sets the authentication method to profile or radius.	H/H
<code>switch dot1x disable</code>	Turns IEEE 802.1x off.	H/H
<code>switch dot1x enable</code>	Turns IEEE 802.1x on.	H/H
<code>switch dot1x port control &lt;portlist&gt; &lt;auto auth unauth&gt;</code>	Sets the port authentication status.	H/H
<code>switch dot1x port disable &lt;portlist&gt;</code>	Turns IEEE 802.1x off on the specified port(s).	H/H
<code>switch dot1x port enable &lt;portlist&gt;</code>	Turns on IEEE 802.1x on the specified port(s).	H/H
<code>switch dot1x port period &lt;portlist&gt; &lt;period&gt;</code>	Set the reauthentication period of the specified port(s).	H/H
<code>switch dot1x port reauth &lt;portlist&gt; &lt;on off&gt;</code>	Turns reauthentication on or off on the specified port(s).	H/H
<code>switch dot1x profile delete &lt;name&gt;</code>	Removes the specified account for profile mode.	H/H
<code>switch dot1x profile set &lt;name&gt; &lt;password&gt;</code>	Sets the account and password for profile mode.	H/H
<code>switch dot1x profile show</code>	Displays the accounts for profile mode.	M/L
<code>switch dot1x radius ip &lt;ip-address&gt;</code>	Sets the RADIUS server IP address.	H/H
<code>switch dot1x radius port &lt;port&gt;</code>	Sets the RADIUS server port.	H/H

**Table 120** IEEE 802.1x Commands (continued)

COMMAND	DESCRIPTION	P
switch dot1x radius secret <i>&lt;secret&gt;</i>	Sets the RADIUS server secret.	H/H
switch dot1x radius show	Displays RADIUS server settings.	M/L
switch dot1x show [ <i>portlist</i> ]	Displays IEEE 802.1x settings.	M/L
statistics dot1x [ <i>portlist</i> ]	Displays the IEEE 802.1x information for the specified port(s).	M/L

## 50.2 DSCP Commands

The following table describes the `dscp` commands. Use these commands to configure the DiffServ Code Point settings of the IES-612-51's ports.

**Table 121** DSCP Commands

COMMAND	DESCRIPTION	P
switch dscp disable <i>&lt;portlist&gt;</i>	Disables DSCP mapping on the specified xDSL or Ethernet port(s).	M/H
switch dscp enable <i>&lt;portlist&gt;</i>	Enables DSCP mapping on the specified xDSL or Ethernet port(s).	M/H
switch dscp map set <i>&lt;srccp&gt;</i> <i>&lt;mappri&gt;</i>	Configures the DSCP-to-802.1p mapping table. <i>srccp</i> : source code point (0~63). For example, 1,3~5,10~15). <i>mappri</i> : mapping priority (0~7).	M/H
switch dscp map show	Displays the DSCP-to-802.1p mapping table.	L/L
switch dscp show [ <i>portlist</i> ]	Displays the DSCP setting for the specified port(s).	L/L

## 50.3 Ethernet Commands

The following table describes the `enet` commands. Use these commands to configure the settings of the IES-612-51's Ethernet ports.

**Table 122** Enet Commands

COMMAND	DESCRIPTION	P
switch enet disable <i>&lt;portlist&gt;</i>	Turns off the specified Ethernet port(s).	H/H
switch enet enable <i>&lt;portlist&gt;</i>	Turns on the specified Ethernet port(s).	H/H
switch enet name <i>&lt;portlist&gt;</i> <i>&lt;name&gt;</i>	Sets the name of the specified Ethernet port(s).	H/H
switch enet reset <i>&lt;portlist&gt;</i>	Resets the Ethernet interface.	H/H
switch enet show	Displays the Ethernet port settings.	M/L
switch enet speed <i>&lt;portlist&gt;</i> <i>&lt;1000fiber 1000copper 100copper auto&gt;</i>	Sets the connection speed of the specified Ethernet port(s).	H/H
statistics enet	Displays Ethernet port settings and statistics.	M/L

## 50.4 Queuemap Commands

The following table describes the `queuemap` commands. Use these commands to configure priority levels and physical queues on the IES-612-51.

**Table 123** Queuemap Commands

COMMAND	DESCRIPTION	P
<code>switch queuemap set &lt;priority&gt; &lt;queue level&gt;</code>	Maps a priority level to a physical queue.	H/H
<code>switch queuemap show</code>	Displays the system's priority level to physical queue mapping.	M/L

## 50.5 RSTP Commands

The following table describes the `rstp` commands. Use these commands to configure Rapid Spanning Tree Protocol on the IES-612-51.

**Table 124** RSTP Commands

COMMAND	DESCRIPTION	P
<code>switch rstp disable</code>	Turns the IES-612-51's RSTP off.	H/H
<code>switch rstp enable</code>	Turns the IES-612-51's RSTP on.	H/H
<code>switch rstp fwdelay &lt;seconds&gt;</code>	Sets the IES-612-51's RSTP forward delay time in seconds.	H/H
<code>switch rstp hellotime &lt;seconds&gt;</code>	Sets the IES-612-51's RSTP hello time in seconds.	H/H
<code>switch rstp maxage &lt;seconds&gt;</code>	Sets the IES-612-51's RSTP max age in seconds.	H/H
<code>switch rstp port disable &lt;portlist&gt;</code>	Disables RSTP on the specified Ethernet port(s).	H/H
<code>switch rstp port enable &lt;portlist&gt;</code>	Enables RSTP on the specified Ethernet port(s).	H/H
<code>switch rstp port pathcost &lt;portlist&gt; &lt;pathcost&gt;</code>	Sets the RSTP pathcost of the specified Ethernet port(s).	H/H
<code>switch rstp port priority &lt;portlist&gt; &lt;priority&gt;</code>	Sets the RSTP priority of the specified Ethernet port(s).	H/H
<code>switch rstp port show</code>	Displays the RSTP status of the specified Ethernet port(s).	M/L
<code>switch rstp priority &lt;priority&gt;</code>	Sets the IES-612-51's RSTP priority.	H/H
<code>switch rstp show</code>	Display the system's rstp settings.	M/L
<code>statistics rstp</code>	Displays rstp information.	M/L

## 50.6 Static Multicast Commands

The following table describes the `smcast` commands. Use these commands to configure static multicasting on the IES-612-51.

**Table 125** Static Multicast Commands

COMMAND	DESCRIPTION	P
<code>switch smcast delete &lt;mac-address&gt;</code>	Removes a static multicast filter entry by deleting the associated MAC address.	H/H
<code>switch smcast set &lt;xdsl-port&gt; &lt;mac-address&gt; &lt;join leave&gt;</code>	Use <code>join/leave</code> to add/ remove multicast MAC addresses on specified ADSL ports, a range of ADSL ports or all ADSL ports.	H/H
<code>switch smcast show</code>	Displays all MAC addresses linked to ADSL ports.	M/L

## 50.7 RMON Command

Use this command to view details of remote monitoring on the IES-612-51's Ethernet ports.

**Table 126** RMON Command

COMMAND	DESCRIPTION	P
<code>statistics rmon Stats history &lt;enet-port&gt;</code>	Displays uplink/subtending link RMON information	M/L

# IP Commands

This chapter shows you how to use the IP commands to configure the IP (Internet Protocol) parameters.

## 51.1 General IP Commands

Use the IES-612-51's management IP addresses to manage it through the network.

The following table describes the values required for many `ip` commands. Other values are discussed with the corresponding commands.

**Table 127** General IP Commands Input Values

LABEL	DESCRIPTION
<i>ip-address</i>	An IP address in dotted decimal notation. For example, 192.168.1.3.
<i>mask-bits</i>	The number of bits in an address's subnet mask. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).
<i>dest-ip</i>	The destination IP address of packets that this static route is to route.
<i>gateway-ip</i>	The IP address of the gateway that you want to send the packets through.
<i>metric</i>	The metric (hop count) of a static route.
<i>name</i>	A name to identify this static route. Up to 31 ASCII characters. Spaces and tabs are not allowed.

The following is a list of general IP commands that help with the management of the IP parameters.

**Table 128** General IP Commands

COMMAND	DESCRIPTION	P
<code>ip set &lt;ip-address&gt; [ &lt;/mask-bits&gt; ]</code>	Changes the IP settings for the IES-612-51's uplink, downlink and IES-612-51 DSL ports. If you don't enter the subnet mask, the system automatically computes one.	H/H
<code>ip gateway &lt;ip-address&gt;</code>	Changes the default gateway (next hop). This tells the IES-612-51 where to send packets that have a destination IP address that is not on the same subnet as the IES-612-51's IP address.	H/H
<code>ip show</code>	Displays the current management IP settings.	M/L
<code>ip ping &lt;ip-address&gt; [count]</code>	Checks for network functionality by sending an echo request to another IP host and waiting for the reply.	M/L
<code>ip route set &lt;dest-ip&gt; [ &lt;/mask-bits&gt; ] &lt;gateway-ip&gt; [metric] &lt;name&gt;</code>	Defines a new, static IP forwarding route or edits an existing one.	H/H

**Table 128** General IP Commands

COMMAND	DESCRIPTION	P
<code>ip route set default &lt;gateway-ip&gt; &lt;metric&gt;</code>	Configures the default static IP forwarding route.	H/H
<code>ip route delete &lt;dest-ip&gt;[/mask-bits]</code>	Removes a static IP forwarding route.	H/H
<code>ip route show</code>	Displays the IES-612-51's routing table.	M/L
<code>ip route flush</code>	Clears the routing table.	H/~
<code>ip arp show</code>	Displays the IES-612-51's IP Address Resolution Protocol (ARP) table. This is the list of IP addresses and matching MAC addresses that the IES-612-51 has resolved.	M/L
<code>ip arp flush</code>	Clears the IES-612-51's IP Address Resolution Protocol table.	H/H
<code>statistics ip</code>	Shows the statistics for the CPU IP traffic.	M/~

### 51.1.1 IP Settings and Default Gateway Example

The following command sequence sets the IES-612-51 to have 192.168.1.3 as the IP address, 255.255.255.0 for the subnet mask and 192.168.1.233 for the default gateway.

```

ras> ip set 192.168.1.3/24
ras> ip gateway 192.168.1.233
ras> config save

```

The IES-612-51 leaves the factory with a default management IP address of 192.168.1.1 and a subnet mask of 255.255.255.0, (ff:ff:ff:00 in hexadecimal notation), and the default gateway set at 192.168.1.254. Make sure that you configure the IP parameters correctly before you connect a IES-612-51 to the network, otherwise, you may interrupt services already running.

### 51.1.2 Route Show Command Example

This example displays the IES-612-51's routing table.

```

ras> ip route show
index dest                gateway                metric name
-----
1      192.168.1.0/24          192.168.1.15          1
2      default                192.168.1.254         1

```

### 51.1.3 ARP Show Command Example

Here is an example of the IES-612-51's IP ARP table.

```

ras> ip arp show
ip                mac address
-----
192.168.2.254     00:00:00:30:ac:00
192.168.15.254    00:00:00:30:ad:00

```

## 51.2 Statistics IP Command Example

This example shows the statistics for the CPU IP traffic.

```
ras> statistics ip
[Ethernet]
inet      : 192.168.2.253      netmask: 0.0.0.0
broadcast: 192.168.255.255    mtu: 1500
in octet  :   10728504  in unicast :        738  in multicast   :   232488
in discard :           0  in error   :           0  in unknown proto:           0
out octet  :     41361  out unicast:     861  out multicast   :           0
out discard:           0  out error   :           0
```





# IP Bridge Commands

The IP bridge function is designed for large-scale, flat, access networks, and it is ideal when the network is based on Ethernet. When the IP bridge is enabled, the IES-612-51 forwards frames based on the destination IP address, instead of the destination MAC address, and it replaces the source MAC address with its own MAC address.

You can follow these steps to set up a simple IP bridge.

- 1 Create a domain. (Each domain is an ISP.)
- 2 Create one or more VLANs in the domain.
- 3 Specify one or more edge routers for the domain.
- 4 Create routing table entries, so the IES-612-51 forwards frames to the appropriate edge router.
- 5 Create downlink interfaces, so the IES-612-51 forwards frames to the appropriate subscribers.
- 6 Create PVCs for the subscribers.

## 52.1 IP Bridge Command Input Values

The following table describes the values required in IP bridge commands. Other values are discussed with the corresponding commands.

**Table 129** IP Bridge Command Input Values

LABEL	DESCRIPTION
<i>domain-name</i>	The name of the domain. You can use 1-31 printable ASCII characters. Spaces are allowed, but you must use double quotation marks (") to enclose the name. (You must use a back slash (\) before double quotation marks in the name itself.)
<i>vlan-id</i>	The ID (<1~4094>) of the VLAN.
<i>join leave</i>	Specifies whether you want to add the specified VLAN to (join) or remove the specified VLAN from (leave) the domain.
<i>ip-address</i>	IP address, in dotted decimal notation.
<i>mask-bits</i>	Number of bits <1~32> in the subnet mask.
<i>nexthop</i>	IP address, in dotted decimal notation.
<i>metric</i>	The metric <1~15> represents the "cost" of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly-connected networks. Select the number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number. If two entries have the same metric, the IES-612-51 uses the one with the lower IP address.

**Table 129** IP Bridge Command Input Values (continued)

<b>LABEL</b>	<b>DESCRIPTION</b>
<i>priority</i>	The IEEE 802.1p priority value <0~7>.
<i>port</i>	The port number of the PVC.
<i>vpi</i>	The VPI of the PVC.
<i>vci</i>	The VCI of the PVC.
<i>port-list</i>	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
DS <i>vcprofile</i>	Assign a VC profile to use for this channel's downstream traffic shaping.
[,US <i>vcprofile</i> ]	Assign a VC profile to use for policing this channel's upstream traffic. The IES-612-51 does not perform upstream traffic policing if you do not specify an upstream VC profile.
<i>super</i>  < <i>vlan-id</i> >	<p>Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The IES-612-51 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.</p> <p>The default VID (1 to 4094). Each PVC must have a unique VID since the IES-612-51 forwards traffic back to the subscribers based on the VLAN ID.</p> <p>You must assign a default VID (1 to 4094) and IEEE 802.1p default priority (0 to 7) to normal channels. Each PVC must have a unique VID (since the IES-612-51 forwards traffic back to the subscribers based on the VLAN ID).</p>
<i>ipoa</i>   <i>ipoe</i>	Specifies whether the PVC is running on Ethernet ( <i>ipoe</i> ) or on ATM ( <i>ipoa</i> ).

# SNMP Commands

This chapter covers commands for configuring the IES-612-51's Simple Network Management Protocol (SNMP) settings.

## 53.1 SNMP Commands

The following table describes common required values in SNMP commands. Other values are discussed with the corresponding commands.

**Table 130** SNMP Commands Input Values

LABEL	DESCRIPTION
<i>community</i>	A password.

The following is a list of the SNMP commands.

**Table 131** SNMP Commands

COMMAND	DESCRIPTION	P
<code>sys snmp getcommunity &lt;community&gt;</code>	Sets the password for the incoming Get- and GetNext- requests from the management station.	H/H
<code>sys snmp setcommunity &lt;community&gt;</code>	Sets the password for the incoming Set- requests from the management station.	H/H
<code>sys snmp trustedhost &lt;ip-address&gt;</code>	Specifies the IP address a trusted host. If you enter a specific IP address, the IES-612-51 will only respond to SNMP messages from this address. You can use the <code>sys client set</code> command to specify additional IP addresses, if necessary. See <a href="#">Section 31.1 on page 215</a> for more information about this command. If you specify 0.0.0.0, the IES-612-51 responds to all SNMP messages it receives, regardless of the settings for the <code>sys client set</code> command.	H/H
<code>sys snmp trapcommunity &lt;community&gt;</code>	Sets the password sent with each trap to the SNMP manager.	H/H
<code>sys snmp trapdst set &lt;index&gt; &lt;ip-address&gt; [&lt;port&gt;]</code>	Specifies the IP address (and port number) of a trap server to which the IES-612-51 sends SNMP traps. If you leave the trap destination set to 0.0.0.0 (default), the IES-612-51 will not send any SNMP traps. <i>index</i> : The number of the trap server (1~4). <i>port</i> : The port number upon which the trap server listens for SNMP traps. The IES-612-51 uses the default of 162 if you do not specify a trap port.	H/H

**Table 131** SNMP Commands

COMMAND	DESCRIPTION	P
<code>sys snmp trapdst del &lt;index&gt;</code>	Removes the specified SNMP trap server setting.	H/H
<code>sys snmp show</code>	Displays the current SNMP get community, set community, trap community, trusted hosts and trap destination settings.	M/L

# ADSL Commands

This chapter describes some of the ADSL commands that allow you to configure and monitor the ADSL ports.

## 54.1 ADSL Command Input Values

The following table describes the values required in ADSL commands. Other values are discussed with the corresponding commands.

**Table 132** ADSL Command Input Values

LABEL	DESCRIPTION
<i>down-downshift-margin</i>	The downstream down shift noise margin (0~31 dB).
<i>down-max-margin</i>	The maximum acceptable ADSL downstream signal/noise margin (0~31db).
<i>down-max-rate</i>	The maximum ADSL downstream transmission rate (32~25000 Kbps).
<i>down-min-margin</i>	The minimum acceptable ADSL downstream signal/noise margin (0~31db).
<i>down-min-rate</i>	The minimum ADSL downstream transmission rate (32~25000 Kbps).
<i>down-target-margin</i>	The target ADSL downstream signal/noise margin (0~31db).
<i>fast interleave[=&lt;up-delay&gt;,&lt;down-delay&gt;]</i>	The latency mode. With interleave, you must also define the upstream and downstream delay (1~255 ms). It is recommended that you configure the same delay for both upstream and downstream.
<i>max-nominal-psd</i>	Maximum nominal transmit PSD (Power Spectral Density) measured in 0.1dBm/Hz.
<i>mx</i>	The downstream carrier tones to be masked (disabled). Each <mx> can use up to 8 hexadecimal digits (00000000~ffffff). Each <mx> represents 32 carrier tones (each hexadecimal digit represents 4 tones). The hexadecimal digit is converted to binary and a '1' disables the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it.
<i>portlist</i>	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<i>profile</i>	A descriptive name for the profile that will define the settings of this port.
<i>up-downshift-margin</i>	The upstream down shift noise margin (0~31 dB).

**Table 132** ADSL Command Input Values

LABEL	DESCRIPTION
<i>up-max-rate</i>	The maximum ADSL upstream transmission rate (32~3000 Kbps).
<i>up-min-margin</i>	The minimum acceptable ADSL upstream signal/noise margin (0~31db). <i>up-max-margin</i> : The maximum acceptable ADSL upstream signal/noise margin (0~31db).
<i>up-min-rate</i>	The minimum ADSL upstream transmission rate (32~3000 Kbps).
<i>up-target-margin</i>	The target ADSL upstream signal/noise margin (0~31db).
<i>up-upshift-margin</i>	The upstream up shift noise margin (0~31 dB).
<i>vlanlist</i>	You can specify a single VLAN <1>, all VLANs <*> or a list of VLANs <1,3,5>. You can also include a range of VLANs <1,5,6~10>.

## 54.2 ADSL Commands

Use these commands to configure the ADSL ports. See [Chapter 13 on page 107](#) for background information on ADSL.

**Table 133** ADSL Commands

COMMAND	DESCRIPTION	P
<code>adsl show &lt;portlist&gt;</code>	Shows the activation status, ADSL mode, maximum upstream and downstream rate settings, profile and name of each ADSL port.	L/L
<code>adsl enable &lt;portlist&gt;</code>	Enables the specified ADSL port(s).	M/H
<code>adsl disable &lt;portlist&gt;</code>	Disables the specified ADSL port(s).	M/H
<code>adsl name &lt;portlist&gt;&lt;name&gt;</code>	Sets the name of an ADSL port(s). <i>name</i> : A descriptive name for the port. You can use up to 31 printable ASCII characters (including spaces and hyphens).	M/H
<code>adsl reset &lt;portlist&gt;</code>	Resets the specified xDSL ports to their defaults.	H/H
<code>adsl tel &lt;portlist&gt;&lt;tel&gt;</code>	Records the telephone number of an ADSL subscriber telephone number. <i>tel</i> : An ADSL subscriber's telephone number. You can use up to 15 ASCII characters (including spaces and hyphens).	M/H
<code>adsl loopback &lt;portlist&gt;&lt;f5&gt;&lt;vpi&gt;&lt;vci&gt;</code>	Performs an OAMF5 loopback test on the specified ADSL port(s). <i>f5</i> : Use f5 to perform an OAMF5 loopback test on the specified DSL port. An Operational, Administration and Maintenance Function 5 test is used to test the connection between two DSL devices. First, the DSL devices establish a virtual circuit. Then the local device sends an ATM F5 cell to be returned by the remote DSL device (both DSL devices must support ATM F5 in order to use this test). <i>vpi, vci</i> : The Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) identify a channel on this port. Possible values for the VPI are 0~255. Possible values for the VCI are 32~65535 if the VPI is 0. If the VPI is not 0, possible values for the VCI are 1~65535.	H/H

**Table 133** ADSL Commands (continued)

COMMAND	DESCRIPTION	P
<code>adsl usnompsd &lt;port&gt;[&lt;max-nominal-psd&gt;]</code>	Displays or sets the upstream maximum nominal transmit PSD (Power Spectral Density). <i>max-nominal-psd</i> : -400 ~ 40 (unit of measure is 0.1dBm/Hz)	H/H
<code>adsl dsnompsd &lt;port&gt;[&lt;max-nominal-psd&gt;]</code>	Displays or sets the downstream maximum nominal transmit PSD (Power Spectral Density).	H/H
<code>adsl uscarrier &lt;port&gt;[&lt;m0&gt;&lt;m1&gt;]</code>	Displays or sets masks for upstream carrier tones from 0 to 63. Masking a carrier tone disables the use of that tone on the specified ADSL port. Use this command to have the system not use an ADSL line's tones that are known to have a high noise level. The most significant bit defines the lowest tone number in a mask. The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it. The most significant bit defines the first tone sequentially. For example, in <m0>, 0x00000001 means tone 31. For example, you could use 0xffff0000 for <m0> to disable upstream carrier tones 0~15 and leave tones 16 ~ 31 enabled. <i>m0</i> : tones 0~31 <i>m1</i> : tones 32~63	H/H
<code>adsl dscarrier0 &lt;port&gt;[&lt;m1&gt;&lt;m2&gt;&lt;m3&gt;&lt;m4&gt;&lt;m5&gt;&lt;m6&gt;&lt;m7&gt;]</code>	Displays or sets masks for downstream carrier tones from 33 to 255. Masking a carrier tone disables the use of that tone on the specified ADSL port. The most significant bit defines the lowest tone number in a mask. <i>m1</i> : tones 32~63 <i>m2</i> : tones 64~95 <i>m3</i> : tones 96~127 <i>m4</i> : tones 128~159 <i>m5</i> : tones 160~191 <i>m6</i> : tones 192~223 <i>m7</i> : tones 224~255	H/H
<code>adsl dscarrier1 &lt;port&gt;[&lt;m0&gt;&lt;m1&gt;&lt;m2&gt;&lt;m3&gt;&lt;m4&gt;&lt;m5&gt;&lt;m6&gt;&lt;m7&gt;]</code>	Displays or sets masks for downstream carrier tones from 256 to 511 on the specified ADSL2+ port(s). Use this command to have the system not use an ADSL line's tones that are known to have a high noise level. <i>m0</i> : tones 256~287 <i>m1</i> : tones 288~319 <i>m2</i> : tones 320~351 <i>m3</i> : tones 352~383 <i>m4</i> : tones 384~415 <i>m5</i> : tones 416~447 <i>m6</i> : tones 448~479 <i>m7</i> : tones 480~511	H/H

**Table 133** ADSL Commands (continued)

COMMAND	DESCRIPTION	P
adsl pmm enable <portlist> <L2 L3>	Enables Power Management (PMM) to reduce the amount of power used overall and reduce the instances of the connection going down. PMM increases or decreases the transmission power based on line conditions. PMM also reduces the number of service interruptions.  L2: Low Power. Sets the power management feature to scale back line usage to the minimum level sufficient to maintain an active connection when there is low level of traffic.  L3: Idle. Sets the power management feature to reduce the power consumption when there is no traffic. Ports may be disabled or go into monitor mode in this state. The power level comes back up when there is traffic.	H/H
adsl pmm set <portlist> <L0 L2>	Sets the power management mode.  L0: Turns off power management on a port.  L2: Low Power. Sets the power management feature to scale back line usage to the minimum level sufficient to maintain an active connection when there is low level of traffic.	H/H
adsl pmm param <portlist> [<l0time><l2time><l2atpr><l2atprt>] [<max-l2rate><min-l2rate><l0tol2-rate>]	Displays or sets PMM parameters for the specified ADSL port(s).  <i>l0time</i> : Set the minimum time in seconds (10~65535) that the ADSL line must stay in L0 power mode before changing to the L2 power mode.  <i>l2time</i> : Set minimum time in seconds (10~65535) that the ADSL line must stay in the L2 power mode before reducing the power again in the L2 power mode.  <i>l2atpr</i> : Set the maximum Aggregate Transmit Power Reduction (ATPR) in decibels (dB) that is permitted in a L2 power reduction. The system can gradually decrease the ADSL line transmission power while it is in the L2 power mode. This is the largest individual power reduction allowed in the L2 power mode. The range is 0~15(dB).  <i>max-l2rate</i> : Set the maximum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39 for example, the system will use 36.  <i>min-l2rate</i> : Set the minimum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39 for example, the system will use 36.  <i>l0tol2-rate</i> : Set the down stream transfer rate (in Kilobits per second) that serves as the threshold for whether the port is to use the L0 or the L2 power mode. The system changes from L0 mode to L2 mode when the downstream transfer rate stays below this threshold for L0 Time. The system changes back from L2 mode to L0 mode when the downstream transfer rate goes above this threshold. This rate must be less than or equal to one half of the Min L2 Rate and at least 16 Kbps.	H/H
adsl pmm show <portlist>	Displays the PMM settings for the specified port(s).	M/L
adsl pmm disable <portlist>	Turns off PMM on the specified port(s).	H/H



**Table 133** ADSL Commands (continued)

COMMAND	DESCRIPTION	P
adsl inp <portlist>[<usinp>[,<dsinp>]]	Sets the upstream (us) and downstream (ds) impulse noise protection minimum setting on the specified ADSL port(s). Sudden spikes in the line's noise level (impulse noise) can cause errors and result in lost packets. Set the impulse noise protection minimum to have a buffer to protect the ADSL physical layer connection against impulse noise. This buffering causes a delay that reduces transfer speeds. It is recommended that you use a non-zero setting for real time traffic that has no error correction (like videoconferencing). <i>usinp</i> : Sets the minimum upstream (us) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols. <i>dsinp</i> : Sets the minimum downstream (ds) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols.	H/H
adsl annexm show <portlist>	Displays the Annex M feature setting for the specified port(s).	M/L
adsl annexm enable <portlist>	This command turns on the Annex M double upstream feature on the specified ADSL2/2+ port(s). This has the upstream connection use tones 6 to 63.	H/H
adsl annexm disable <portlist>	This command turns off the Annex M double upstream feature on the specified ADSL2/2+ port(s).	H/H
adsl queuemap set <priority> <queue-level>	IEEE 802.1p defines up to 8 separate traffic types by inserting a tag into a MAC-layer frame that contains bits to define class of service. Frames without an explicit priority tag are given the default priority of the ingress port. Use this command to configure the priority level-to-physical queue mapping. <i>queue-level</i> : The device has 4 physical queues that you can map to the 8 priority levels for outgoing Ethernet traffic. The device has 8 physical queues that you can map to the 8 priority levels for outgoing DSL traffic. Traffic assigned to higher index queues gets through the device faster while traffic in lower index queues is dropped if the network is congested.	H/H
adsl queuemap show	Displays the xDSL priority level to physical queue mapping.	M/L
adsl dsbcast enable <portlist> <vlanlist>	Enables downstream broadcast packets sent to specified VLANs on specified ports.	M/H
adsl dsbcast show <portlist>	Shows downstream broadcast settings on specified xDSL port(s).	L/L
adsl dsbcast disable <portlist> <vlanlist>	Disables downstream broadcast packets sent to specified VLANs on specified ports.	M/H
adsl sra enable <portlist>	Turns on Seamless Rate Adaptation (SRA) ADSL2+ on the specified port(s).	H/H
adsl sra show <portlist>	Displays the SRA ADSL2+ setting for the specified port(s).	M/L
adsl sra disable <portlist>	Turns off SRA ADSL2+ on the specified port(s)	H/H

### 54.2.1 ADSL Show Command Example

The following example displays information on ADSL port 5.

**Figure 136** ADSL Show Command Example

```
ras> adsl show 5
port enable mode      up/downstream profile      name
-----
  5    -    auto      512/ 2048 DEFVAL      -
```

### 54.2.2 ADSL Name Command Example

The following example sets ADSL port 5 to have the name super.

**Figure 137** ADSL Name Command Example

```
ras> adsl name 5 super
```

### 54.2.3 ADSL Tel Command Example

The following example records the telephone number 12345678 for ADSL port 5.

**Figure 138** ADSL Tel Command Example

```
ras> adsl tel 5 12345678
```

### 54.2.4 ADSL Loopback Command Example

The following example has the IES-612-51 perform an OAMF5 loopback test on ADSL port 1's PVC at VPI 0 and VCI 33.

**Figure 139** ADSL Loopback Command Example

```
ras> adsl loopback 1 f5 0 33
port[1] OAM F5 loopback test: failed
```

### 54.2.5 ADSL Upstream PSD Command Example

The following example sets the upstream maximum nominal transmit PSD for port 7 to -10 dBm/Hz.

**Figure 140** ADSL Upstream PSD Command Example

```
ras> adsl usnompsd 7 -100
```

## 54.2.6 ADSL Downstream PSD Command Example

The following example sets the downstream maximum nominal transmit PSD for port 7 to -10 dBm/Hz.

**Figure 141** ADSL Downstream PSD Command Example

```
ras> adsl dsnompsd 7 -10
```

## 54.2.7 ADSL Upstream Carrier Command Example

The following example disables upstream carrier tones 0~15 for ADSL port 5.

**Figure 142** ADSL Upstream Carrier Command Example

```
ras> adsl uscarrier 5 ffff0000 00000000
```

The following example displays the results.

**Figure 143** ADSL Upstream Carrier Command Display Example

```
ras> adsl uscarrier 5

          us carrier
port      m0      m1
----  |-----|-----|
      5  FFFF0000 00000000
Tone:
m0:0-31, m1:32-63
```

## 54.2.8 ADSL Downstream Carrier0 Command Example

The following example disables downstream carrier tone 71 for ADSL port 5.

**Figure 144** ADSL Downstream Carrier0 Command Example 1

```
ras> adsl dscarrier0 5 0 01000000 0 0 0 0 0
```

The following example displays the results.

**Figure 145** ADSL Downstream Carrier0 Command Display Example

```
ras> adsl dscarrier0 5

                                ds carrier
port      m1      m2      m3      m4      m5      m6      m7
----  |-----|-----|-----|-----|-----|-----|-----|
      5  00000000 01000000 00000000 00000000 00000000 00000000 00000000
Tone:
m1:32-63, m2:64-95, m3:96-127, m4:128-159
m5:160-191, m6:192-223, m7:224-255
```

This example disables downstream carrier tones 70 and 71 for ADSL port 5.

**Figure 146** ADSL Downstream Carrier0 Command Example 2

```
ras> adsl dscarrier0 5 0 03000000 0 0 0 0 0
```

## 54.2.9 ADSL Downstream Carrier1 Command Example

The following example disables downstream carrier tone 307 for ADSL2+ port 5.

**Figure 147** ADSL Downstream Carrier1 Command Example 1

```
ras> adsl dscarrier1 5 0 00001000 0 0 0 0 0 0
```

The following example disables downstream carrier tones 304 to 307 for ADSL2+ port 5.

**Figure 148** ADSL Downstream Carrier1 Command Example 2

```
ras> adsl dscarrier1 5 0 0000f000 0 0 0 0 0 0
```

The following example displays the results.

**Figure 149** ADSL Downstream Carrier1 Command Display Example

```
ras> adsl dscarrier1 5

ds carrier
port      m0      m1      m2      m3      m4      m5      m6      m7
----      -|-----|-----|-----|-----|-----|-----|-----|-----|
5         00000000 000F0000 00000000 00000000 00000000 00000000 00000000
00000000
Tone:
m0:256-287, m1:288-319, m2:320-351, m3:352-383
m4:384-415, m5:416-447, m6:448-479, m7:480-511
```

## 54.2.10 PMM Parameters Command Example

The following example sets ADSL port 5 to use the following PMM settings.

- Stay in the L0 power mode for 180 seconds before a change to the L2 power mode is permitted.
- Once in L2 power mode, wait for 90 seconds before further reducing the transmission power.
- Each L2 power mode power reduction can only be 2 dB or less.
- The total power reduction allowed in the L2 power mode is 15 dB.

**Figure 150** PMM Parameters Command Example

```
ras> adsl pmm param 5 180 90 2 15
```

### 54.2.11 Impulse Noise Protection Command Example

The following example sets the impulse noise protection minimum to 1 DMT symbols for upstream and 0.5 DMT symbols for downstream for ADSL port 5.

**Figure 151** Impulse Noise Protection Command Example

```
ras> adsl inp 5 2 1
```

## 54.3 ADSL Profile Commands

**Table 134** ADSL Profile Commands

COMMAND	DESCRIPTION	P
<code>adsl profile show [profile]</code>	Displays the specified ADSL profile or all ADSL profiles if you do not specify one.	L/L
<pre>adsl profile set &lt;profile&gt; &lt;fast interleave[=&lt;up- delay&gt;,&lt;down-delay&gt;]&gt;&lt;up-max- rate&gt;&lt;down-max-rate&gt;[&lt;up-target- margin&gt;&lt;up-min-margin&gt;&lt;up-max- margin&gt;&lt;up-min-rate&gt;&lt;down- target-margin&gt;&lt;down-min- margin&gt;&lt;down-max-margin&gt;&lt;down- min-rate&gt;&lt;up-downshift- margin&gt;&lt;up-up-shift- margin&gt;&lt;down-downshift- margin&gt;&lt;down-upshift-margin&gt;]</pre>	<p>The profile is a table that contains information on ADSL line configuration. Each entry in this table reflects a parameter defined by a manager, which can be used to configure the ADSL line.</p> <p>Note that the default value will be used for any of the above fields that are omitted.</p> <p>The upstream rate must be less than or equal to the downstream rate.</p> <p>Even though you can specify arbitrary numbers in the profile set command, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32 Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64 Kbps.</p> <p>The ADSL up/down shift noise margins define the threshold that triggers rate adaptation. For example: The target SNR is 6, and the up/down shift noise margins are 9/3.</p> <p>If the signal becomes better and the SNR is higher than 9, rate adaptation is triggered and the line rate becomes higher</p> <p>If the signal becomes bad and the SNR is lower than 3, rate adaptation is triggered and the line rate becomes lower.</p> <p>After you create an ADSL profile, you can assign it to any of the ADSL ports on any of the ADSL IES-612-51 in the IES-612-51.</p>	H/H

**Table 134** ADSL Profile Commands (continued)

COMMAND	DESCRIPTION	P
<code>adsl profile delete &lt;profile&gt;</code>	Allows you to delete an individual ADSL profile by its name. You cannot delete a profile that is assigned to any of the DSL ports in the IES-612-51. Assign a different profile to any DSL ports that are using the profile that you want to delete, and then you can delete the profile.	H/H
<code>adsl profile map &lt;portlist&gt; &lt;profile&gt; &lt;glite gdmt t1413 auto adsl2 adsl2+&gt;</code>	<p>Assigns a specific profile to an individual port and sets the port's ADSL mode (or standard). The profile defines the maximum and minimum upstream/downstream rates, the target upstream/downstream signal noise margins, and the maximum and minimum upstream/downstream acceptable noise margins of all the ADSL ports to which you assign the profile.</p> <p><code>glite gdmt t1413 auto adsl2 adsl2+:</code> The ADSL operational mode.</p> <p>When set to <code>auto</code>, the port follows whatever mode is set on the other end of the line.</p> <p><b>Note:</b> When the mode is set to <code>auto</code>, the connection rates are governed by the negotiated ADSL mode regardless of the rates configured in the profile. For example, if the profile is set to use a rate of 18000 Kbps, that speed is only supported if the negotiated ADSL mode is ADSL 2+. Any other ADSL mode will limit the rate to what is supported by the specific ADSL standard.</p>	H/H

### 54.3.1 ADSL Profile Show Command Example

The following example displays the ADSL DEFVAL profile.

**Figure 152** ADSL Profile Show Command Example

```

ras> adsl profile show DEFVAL
01. DEFVAL      latency mode: interleave
                up stream down stream
                -----
max rate      (kbps):          512          2048
min rate      (kbps):           32           32
latency delay (ms):             4            4
max margin    (db):            31           31
min margin    (db):             0            0
target margin (db):             6            6
up shift margin(db):            9            9
down shift margin(db):          3            3

```

### 54.3.2 ADSL Profile Set Command Example

The following example creates a premium profile (named “gold”) for providing subscribers with very high connection speeds and no interleave delay. It also sets the upstream target signal/noise margin to 5 db, the upstream minimum acceptable signal/noise margin to 0 db, the upstream maximum acceptable signal/noise margin to 30 db, the upstream minimum ADSL

transmission rate to 128 Kbps, the downstream target signal/noise margin to 5 db, the downstream minimum acceptable signal/noise margin to 0 db, the downstream maximum acceptable signal/noise margin to 30 db and the downstream minimum ADSL transmission rate to 256Kbps.

The upstream down shift noise margin is 0 dB. The upstream up shift noise margin is 6 dB. The downstream down shift noise margin is 0 dB. The downstream up shift noise margin is 6 dB.

**Figure 153** ADSL Profile Set Command Example 1

```
ras> adsl profile set gold fast 1200 24000 5 0 30 128 5 0 30 256 0 6 0 6
```

This next example creates a similar premium profile (named `goldi`), except it sets an interleave delay of 16 ms for both upstream and downstream traffic.

**Figure 154** ADSL Profile Set Command Example 2

```
ras> adsl profile set goldi interleave=16,16 1200 24000 5 0 30 128 5 0 30 256  
0 6 0 6
```

After you create an ADSL profile, you can assign it to any of the ADSL ports in the IES-612-51.

### 54.3.3 ADSL Profile Delete Command Example

The following example deletes the gold ADSL profile.

**Figure 155** ADSL Profile Delete Command Example

```
ras> adsl profile delete gold
```

### 54.3.4 ADSL Profile Map Command Example

The following example sets ADSL port 1 to have the gold profile in G.dmt mode.

**Figure 156** ADSL Profile Delete Command Example

```
ras> adsl profile map 1 gold gdmr
```



## 54.4 Statistics ADSL Commands

Use these commands to display ADSL port statistics.

**Table 135** ADSL Statistics Commands

COMMAND	DESCRIPTION	P
<code>statistics adsl show [portlist]</code>	Displays ADSL port connection statistics including the status (V for enabled, - for disabled), ADSL operational mode, upstream and downstream maximum rates, up time and the number of errored seconds.	M/L
<code>statistics adsl linedata &lt;portlist&gt;</code>	Shows the line bit allocation of an ADSL port. Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into tones. This command displays the number of bits transmitted for each tone. This can be used to determine the quality of the connection, whether a given sub-carrier loop has sufficient margins to support ADSL transmission rates, and possibly to determine whether certain specific types of interference or line attenuation exist. See the ITU-T G.992.1 recommendation for more information on DMT. The better (or shorter) the line, the higher the number of bits transmitted for a DMT tone. The maximum number of bits that can be transmitted per DMT tone is 15. "upstream carrier load" displays the number of bits transmitted per DMT tone for the upstream channel (from the subscriber's DSL modem or router to the IES-612-51). "downstream carrier load" displays the number of bits received per DMT tone for the downstream channel (from the IES-612-51 to the subscriber's DSL modem or router). The bit allocation contents are only valid when the link is up.	M/L
<code>statistics adsl lineinfo &lt;portlist&gt;</code>	Shows the line operating values of an ADSL port.	M/L
<code>statistics adsl lineperf &lt;portlist&gt;</code>	Shows the line performance counters of an ADSL port.	M/L
<code>statistics adsl linerate &lt;portlist&gt;</code>	Displays the line rate for the specified port(s).	M/L
<code>statistics adsl 15mperf &lt;portlist&gt;[count &lt;0~96&gt;]</code>	Displays line performance statistics for the current and previous 15-minute periods. <code>count &lt;0~96&gt;</code> : Specify for which 15-minute interval (0~96) you want to display performance statistics. 0 is the current 15 minutes.	M/L
<code>statistics adsl 1dayperf &lt;portlist&gt;</code>	Displays line performance statistics for the current and previous 24 hours.	M/L
<code>adsl linediag setld &lt;port&gt;</code>	Performs line diagnostics on the specified port. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. It takes about one minute for the line diagnostics to finish.	H/H
<code>adsl linediag getld &lt;port&gt;</code>	Displays the line diagnostics results after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line.  Note: Wait at least one minute after using the line diagnostic set command before using this command.	L/L

**Table 135** ADSL Statistics Commands (continued)

COMMAND	DESCRIPTION	P
<code>adsl linediag getld992-3 &lt;port&gt;</code>	Displays the line diagnostics results in the format defined in the ITU-T G.992.3 standard after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line.  <b>Note:</b> Wait at least one minute after using the line diagnostic set command before using this command.	L/L
<code>adsl linediag setselt &lt;port&gt;</code>	Performs a single end line test on the specified port. This test checks the distance to the subscriber's location.  <b>Note:</b> The port must have an open loop. There cannot be a DSL device, phone, fax machine or other device connected to the subscriber's end of the telephone line.	H/H
<code>adsl linediag getselt &lt;port&gt;</code>	Displays the status and the results of the SELT test on the specified port. The report tells you what gauge of telephone wire is connected to the port and the approximate length of the line measured both in meters and thousands of feet.	L/L
<code>adsl linediag toneDiag &lt;port&gt;</code>	Displays the tone diagnostics for a port in the format defined in the ITU-T G.992.3 standard. You do not need to use the line diagnostics set command first. Use the tone diagnostics to analyze problems with the physical ADSL line.	L/L

### 54.4.1 ADSL Show Command Example

The following example displays connection statistics for ADSL port 1.

**Figure 157** ADSL Show Command Example

```

ras> statistics adsl show 1
port status mode      up/downstream      up time error second(15M/24H)
-----
  1   V   adsl2      512/ 9089 00000:00:04:59      15/15

```

## 54.4.2 Linedata Command Example

In the following example, the upstream channel is carried on tones 7 to 39 and the downstream channel is carried on tones 53 to 259 (space is left between the channels to avoid interference).

**Figure 158** Linedata Command Example

```

ras> statistics adsl linedata 1
[port 1]
up stream carrier load: number of bits per symbol(tone):
tone   0- 19: 00 00 00 00 00 00 02 03 04 05 - 06 07 07 07 07 07 07 08 08
tone  20- 39: 08 08 07 08 08 07 07 06 06 05 - 04 03

down stream carrier load: number of bits per symbol(tone):
tone   0- 19: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00
tone  20- 39: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00
tone  40- 59: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 01 01 01 01 01 02
tone  60- 79: 02 02 02 02 00 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone  80- 99: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 100-119: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 120-139: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 140-159: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 160-179: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 180-199: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 200-219: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 220-239: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 240-259: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02

```

## 54.4.3 ADSL Lineinfo Command Example

An example is shown next.

**Figure 159** ADSL Lineinfo Command Example

```

ras> statistics adsl lineinfo 8
[port 8]
operating modes:
- service type in operation: adsl2+
- TRELLIS operation mode   : on
connection detail:
- down/up stream interleaved delay (ms): 3/ 2
- total transceiver DS output power  (dbm): -2.5
- total transceiver US output power  (dbm): 11.5

atuc information:
- vendor id:      30304235303035300000000000000000
- version number: 66323330323030300000000000000000
- serial number :
3032303030653033653930303037000000000000000000000000000000000000
00
atur information:
- vendor id:      b5004244434d00000000000000000000
- version number: 41327042303139610000000000000000
- serial number :
0000000000000000000000000000000000000000000000000000000000000000

```

The service type in operation is the ADSL standard that the port is using: G.dmt or ANSI T1.413 issue 2.

Trellis coding helps to reduce the noise in ADSL transmissions. Trellis may reduce throughput but it makes the connection more stable.<sup>3</sup>

The numbers of milliseconds of interleave delay for downstream and upstream transmissions are listed. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the higher the power will be. "DS" refers to the power output of the IES-612-51 "US" refers to the power output of the subscriber's ADSL modem or router.

Information obtained prior to training to steady state transition will not be valid or will be old information.

The `atuc` information fields show data acquired from the ATUC (ADSL Termination Unit – Central), in this case IES-612-51, during negotiation/provisioning message interchanges.

The `atur` information fields show data acquired from the ATUR (ADSL Termination Unit – Remote), in this case the subscriber's ADSL modem or router, during negotiation/provisioning message interchanges. This information can help in identifying the subscriber's ADSL modem or router.

The vendor ID, vendor version number and product serial number are obtained from vendor ID fields (see ITU-T G.994.1) or R-MSGs1 (see T1.413).

#### 54.4.4 Lineperf Command Example

An example is shown next.

**Figure 160** Lineperf Command Example

```

ras> statistics adsl lineperf 1
[port 1] Perf since boot up
nfebe-I/nfebe-ni      :          46/          0 (Far End CRC)
ncrc-I/ncrc-ni       :           5/          0 (Near End CRC)
nfecc-I/nfecc-ni      :           0/          0 (Far End Corrected FEC)
nfec-I/nfec-ni        :          28/          0 (Near End Corrected FEC)
init-atuc/init-atur:    23/          -
es-atuc /es-atur      :    27/          92
ses-atuc /ses-atur    :    26/          60
uas-atuc /uas-atur    :   1515/       1515
lpr-atuc /lpr-atur    :     -/           2

```

These counters display line performance data that has been accumulated since the system started. In the list above the definitions of near end/far end will always be relative to the ATU-C (ADSL Termination Unit-Central Office). Downstream (ds) refers to data from the ATU-C and upstream (us) refers to data from the ATU-R. "I" stands for interleaved and "ni" stands for non-interleaved (fast mode).

3. At the time of writing, the IES-612-51 always uses Trellis coding.

A block is a set of consecutive bits associated with the path; each bit belongs to one and only one block. Consecutive bits may not be contiguous in time.

**Table 136** Line Performance Counters

<b>LABEL</b>	<b>DESCRIPTION</b>
nfebe	The Number of Far End Block Errors (Cyclic Redundancy Check).
ncrc	Near end Cyclic Redundancy Check errors.
nfecc	The Far End blocks repaired by Forward Error Correction.
nfec	The Near End blocks repaired by Forward Error Correction.
init	The number of link ups and link downs.
es	The Number of Errored Seconds. This is how many seconds contained at least one errored block or at least one defect.
ses	The Number of Severely Errored Seconds. This is how many seconds contained 30% or more errored blocks. This is a subset of n-es.
uas	The Number of Unavailable Seconds.
lpr	The Number of Loss of Power Seconds (on the ATUR) that have occurred.

### 54.4.5 15 Minute Performance Command Example

An example is shown next.

**Figure 161** 15 Minute Performance Command Example

```

ras> statistics adsl 15mperf 10
Port 10 Current 15 Min elapsed time:833 sec (Link UP)
  Current 15 Min PM:      ATUC      ATUR
    lofs:                 0         0
    loss:                 0         0
    lols:                 0         -
    lprs:                 -         0
    eSs:                  0         0
    inits:                0         -
    sesl:                 0         0
    uasl:                 0         0
  History 15 Min PM-1:    ATUC      ATUR
    lofs:                 0         0
    loss:                 0         0
    lols:                 0         -
    lprs:                 -         0
    eSs:                  0         0
    inits:                1         -
    sesl:                 0         0
    uasl:                 0         0
  History 15 Min PM-2:    ATUC      ATUR
    lofs:                 0         0
    loss:                 0         0
    lols:                 0         -
    lprs:                 -         0
    eSs:                  0         0
    inits:                0         -
    sesl:                 0         0
    uasl:                 0         0

```

The following table explains these counters.

**Table 137** 15 Minute Performance Counters

LABEL	DESCRIPTION
atuc	Upstream. These statistics are for the connection (or traffic) coming from the subscriber's device to the IES-612-51.
atur	Downstream. These statistics are for the connection (or traffic) going from the IES-612-51 to the subscriber's device.
lofs	The number of Loss Of Frame seconds that have occurred within the 15-minute period.
loss	The number of Loss Of Signal seconds that have occurred within the 15-minute period.
lols	The number of Loss Of Link seconds that have occurred within the 15-minute period.
lprs	The number of Loss of Power seconds (on the ATUR) that have occurred within the 15-minute period.

**Table 137** 15 Minute Performance Counters (continued)

LABEL	DESCRIPTION
eSs	The number of Errored Seconds that have occurred within the 15-minute period.
inits	The number of link ups and link downs that have occurred within the 15-minute period.
sesl	The number of Severely Errored Seconds that have occurred within the 15-minute period.
uasl	The number of UnAvailable Seconds that have occurred within the 15-minute period.

These counters are also used in the alarm profiles (see [Section 44.1 on page 275](#)).

## 54.4.6 1 Day Performance Command Example

An example is shown next.

**Figure 162** 1Day Performance Command Example

```

ras> statistics adsl 1dayperf 10
Port 10 current 1 day elapsed time:7827 sec (Link UP)
Current 1 Day Perf      ATUC      ATUR
      lofs              0          0
      loss              0          0
      lols              0          -
      lprs              -          0
      eSs               0          0
      inits             1          -
      sesl              1          0
      uasl              0          0

Port 10 previous 1 day elapsed time:0 sec
Previous 1 Day Perf      ATUC      ATUR
      lofs              0          0
      loss              0          0
      lols              0          -
      lprs              -          0
      eSs               0          0
      inits             0          -
      sesl              0          0
      uasl              0          0

```

See [Table 137 on page 342](#) for details about these counters.

### 54.4.7 Line Diagnostics Set Command Example

The following example performs line diagnostics on ADSL port 1. The screen displays a message confirming upon which ADSL port line diagnostics will be performed.

**Figure 163** Line Diagnostics Set Command Example

```
ras> adsl linediag setld 1
Line- 1 set to Line Diagnostic Mode
```

### 54.4.8 Line Diagnostics Get Command Example

The following example displays the line diagnostics results for ADSL port 1.

**Figure 164** Line Diagnostics Get Command Example

```
ras> adsl linediag getld 1
Line_Diagnostics_Parameter,_channel: 0

number_of_subcarries: 256      32
hlinScale: 19625      32767
latn: 54      0
satn: 52      8
snrm: 60      60
attndr: 12140000      1120000
farEndActatp: 75      125

i      li.rl      li.im      log      QLN      SNR
0      32768      32768      1023      255      255
1      32768      32768      1023      255      255
2      32768      32768      1023      255      255
3      32768      32768      1023      255      255
4      32768      32768      1023      255      255
5      32768      32768      1023      255      255
6      11604      4752      83      191      132
7      17794      5598      48      190      139
8      22385      5567      30      184      147
9      24903      5163      21      163      152
10     26768      5013      15      185      159
11     29179      5494      8       175      165
12     31605      6574      1       172      168
13     32766      8020      1023     186      170
14     32159      9597      1023     183      173
15     30990      11350     1023     182      173
16     30432      13730     1023     186      172
17     30259      16694     1023     182      170
18     29137      19570     1023     171      170
19     26499      21554     1023     186      172
20     23288      22973     0        173      174
```



The following table lists the line diagnostics test parameters that display, see the ITU-T's G.992.3 for more information.

**Table 138** Line Diagnostics Get Command

<b>LABEL</b>	<b>DESCRIPTION</b>
number_of_subcarries	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 kHz each. The first number is the total number of DMT sub-carriers the ADSL connection is using. The second number indicates how many upstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. These are the maximum upstream and downstream scale factors used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in .1 dB).
satn:	This is the upstream and downstream Signal Attenuation (in .1 dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in .1 dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-612-51 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in .1 dBm)
i	This is the index number of the DMT sub-carrier.
li.rl	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the real part of the complex number used in producing the channel characteristics function for this sub-carrier.
li.im	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the imaginary part of the complex number used in producing the channel characteristics function for this sub-carrier
log	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.
QLN	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR	This is the upstream and downstream Signal-to-Noise Ratio (in .1 dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

### 54.4.9 Line Diagnostics Get 992.3 Command Example

The following example displays the line diagnostics results for ADSL port 1.

**Figure 165** Line Diagnostics Get 992.3 Command Example

```

ras> adsl linediag getld992_3 1
port: 1

number_of_subcarriers:      256      32
hlinScale:                  17024    32767
latn:                       2.0      0.2
satn:                       2.0      0.0
snrm:                       -0.0     6.0
attndr:                     10398468 1152000
farEndActatp:              20.4     12.4

```

i	li.rl	li.im	log (dB)	QLN (dBm)	SNR (dB)
0	N/A	N/A	N/A	N/A	N/A
1	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A
6	0.31557	0.00796	-9.9	-120.5	8.5
7	0.43477	-0.31599	-5.3	-120.0	42.0
8	0.28313	-0.67576	-2.6	-119.5	44.5
9	-0.01016	-0.86645	-1.1	-119.0	46.5
10	-0.28423	-0.89969	-0.4	-118.5	51.5
11	-0.48750	-0.85403	-0.1	-118.0	52.0
12	-0.63495	-0.79630	0.2	-118.0	54.5
13	-0.75373	-0.75644	0.6	-117.5	56.5
14	-0.84457	-0.72510	1.0	-117.0	56.5
15	-0.89389	-0.68549	1.1	-116.5	56.5
16	-0.90713	-0.64631	1.0	-114.5	56.5
17	-0.91955	-0.63196	1.0	-116.0	57.0
18	-0.95053	-0.64860	1.3	-116.0	57.0
19	-0.97781	-0.67563	1.6	-115.5	57.0
20	-0.97161	-0.69211	1.6	-115.5	57.5

The following table lists the line diagnostics test parameters that display, see the ITU-T's G.992.3 for more information.

**Table 139** Line Diagnostics Get 992.3 Command

LABEL	DESCRIPTION
number_of_subcarriers	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. The first number is the total number of DMT sub-carriers the ADSL connection is using. The second number indicates how many upstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. These are the maximum upstream and downstream scale factors used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).

**Table 139** Line Diagnostics Get 992.3 Command (continued)

LABEL	DESCRIPTION
satn:	This is the upstream and downstream Signal Attenuation (in dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-612-51 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.
li.rl	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the real part of the complex number used in producing the channel characteristics function for this sub-carrier.
li.im	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the imaginary part of the complex number used in producing the channel characteristics function for this sub-carrier
log	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. It is measured in dB. This can be used in analyzing the physical condition of the ADSL line.
QLN	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm. The QLN can be used in analyzing crosstalk.
SNR	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

### 54.4.10 SELT Diagnostic Set Command Example

The following example starts a SELT test on ADSL port 1.

**Figure 166** SELT Diagnostic Set Command Example

```
ras> adsl linediag setselt 1
```

### 54.4.11 SELT Diagnostic Get Command Example

The following example displays the status and results SELT diagnostic results for ADSL port 1.

**Figure 167** Line Diagnostics Get Command Example

```

ras> adsl linediag getselt 1
port      inprogress      cableType  loopEstimateLength
-----
1          INPROGRESS      24AWG      0 m(0.00 kFt)
ras> adsl linediag getselt 1
port      inprogress      cableType  loopEstimateLength
-----
1          DONE            24AWG      0 m(0.00 kFt)

```

### 54.4.12 Tone Diagnostics 992.3 Command Example

The following example displays the tone diagnostics results for ADSL port 8.

**Figure 168** Tone Diagnostics Command Example

```

ras> ad lined toneD 1
port: 1

number_of_subcarries:      512      32
latn:                      24.1      2.7
satn:                      24.1      61.3
snrm:                      30.2      25.0
attnr:                     28008000  1248000
farEndActatp:              -31.0     11.9
i    log(dB)  QLN(dBm)  SNR(dB)
0    N/A      N/A      N/A
1    N/A      N/A      N/A
2    N/A      N/A      N/A
3    N/A      N/A      N/A
4    N/A      N/A      N/A
5    N/A      N/A      N/A
6    -21.1    -125.5    17.5
7    -15.3    -124.0    26.0
8    -9.9     -123.0    31.0
9    -5.7     -120.5    38.0
-----Snip-----
509    6.0     -124.0    29.0
510    6.0     -124.0    29.0
511    6.0     -123.0    26.5

```

The following table lists the tone diagnostic parameters. See the ITU-T's G.992.3 for more information.

**Table 140** ToneDiag Command

<b>LABEL</b>	<b>DESCRIPTION</b>
number_of_subcarries	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. This number indicates how many upstream and downstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the maximum upstream and downstream scale factor used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).
satn:	This is the upstream and downstream Signal Attenuation (in dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-612-51 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.
log (dB)	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.
QLN (dBm)	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR (dB)	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

## 54.5 Alarm Profile Commands

Configure alarm profiles to set alarm settings and thresholds for the ADSL ports.

**Table 141** Alarm Profile Commands

COMMAND	DESCRIPTION	P
<code>adsl alarmprofile show [profile]</code>	Displays the settings of the specified alarm profile (or all of them if you do not specify one).	L/L
<pre>adsl alarmprofile set &lt;profile&gt; [&lt;atuc lofs&gt;&lt;atur lofs&gt;&lt;atuc loss&gt;&lt;atur loss&gt;&lt;atuc lols&gt; &lt;atuc lprs&gt;&lt;atur lprs&gt;&lt;atuc ess&gt; &lt;atur ess&gt;&lt;atuc fast rateup&gt; &lt;atur fast rateup&gt;&lt;atuc interleave rateup&gt;&lt;atur interleave rateup&gt;&lt;atuc fast ratedown&gt;&lt;atur fast ratedown&gt; &lt;atuc interleave ratedown&gt;&lt;atur interleave ratedown&gt;&lt;init fail enable&gt;&lt;atuc fail fast&gt;&lt;atuc ses&gt;&lt;atur ses&gt;&lt;atuc uas&gt;&lt;atur uas&gt;]</pre>	<p>This command configures settings and thresholds that define when the IES-612-51 is to send an alarm trap and generate a syslog entry.</p> <p>Configure alarm profiles first and then use the <code>alarmprofile map</code> command to set the IES-612-51 to use them with specific ADSL ports.</p> <p><i>atuc</i>: Upstream. These parameters are for the connection (or traffic) coming from the subscriber's device to the IES-612-51.</p> <p><i>atur</i>: Downstream. These parameters are for the connection (or traffic) going from the IES-612-51 to the subscriber's device.</p> <p><i>atuc lofs, atur lofs</i>: The number of Loss Of Frame seconds that are permitted to occur within 15 minutes.</p> <p><i>atuc loss, atur loss</i>: The number of Loss Of Signal seconds that are permitted to occur within 15 minutes.</p> <p><i>atuc lols</i>: The number of Loss Of Link seconds that are permitted to occur within 15 minutes.</p> <p><i>atuc lprs, atur lprs</i>: The number of Loss of Power seconds that are permitted to occur (on the ATUR) within 15 minutes.</p> <p><i>atuc ess, atur ess</i>: The number of Errored Seconds that are permitted to occur within 15 minutes.</p> <p><i>atuc fast rateup, atur fast rateup</i>: A rate in kilobits per second (kbps). If a fast mode connection's upstream transmission rate increases by more than this number, then a trap is sent.</p> <p><i>atuc interleave rateup, atur interleave rateup</i>: A rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate increases by more than this number, then a trap is sent.</p> <p><i>atuc fast ratedown, atur fast ratedown</i>: A rate in kilobits per second (kbps). If a fast mode connection's downstream transmission rate decreases by more than this number, then a trap is sent.</p> <p><i>atuc interleave ratedown, atur interleave ratedown</i>: A rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate decreases by more than this number, then a trap is sent.</p> <p><i>init fail enable</i>: "1" sets the profile to trigger an alarm for an initialization failures trap. "2" sets the profile to not trigger an alarm for an initialization failures trap.</p> <p><i>atuc fail fast</i>: The number of failed fast retrains that are permitted to occur within 15 minutes.</p> <p><i>atuc ses, atur ses</i>: The number of Severely Errored Seconds that are permitted to occur within 15 minutes.</p> <p><i>atuc uas, atur uas</i>: The number of UnAvailable Seconds that are permitted to occur within 15 minutes.</p>	H/H
<code>adsl alarmprofile delete &lt;profile&gt;</code>	This command allows you to delete an individual ADSL alarm profile by its name. You cannot delete the DEFVAL alarm profile.	

**Table 141** Alarm Profile Commands (continued)

COMMAND	DESCRIPTION	P
adsl alarmprofile map <portlist> <profile>	Sets the IES-612-51 to use an (already-configured) alarm profile with the specified ADSL ports.	H/H
adsl alarmprofile showmap [port]	Displays the alarm profile(s) mapped to the specified port(s).	L/L
adsl alarmprofile showport <port>	Displays the alarm profile settings for the specified port.	L/~

### 54.5.1 Alarm Profile Show Command Example

The following example displays the default alarm profile (DEFVAL).

**Figure 169** Alarm Profile Show Command Example

```

ras> adsl alarmprofile show DEFVAL
01. DEFVAL

                                     ATU-C    ATU-R
                                   -----
Thresh15MinLofs                    (sec):      0      0
Thresh15MinLoss                    (sec):      0      0
Thresh15MinLols                    (sec):      0      ---
Thresh15MinLprs                    :           0      0
Thresh15MinESs                    (sec):      0      0
ThreshFastRateUp                   (bps):      0      0
ThreshInterleaveRateUp             (bps):      0      0
ThreshFastRateDown                 (bps):      0      0
ThreshInterleaveRateDown           (bps):      0      0
InitFailureTrap(1-enable, 2-disable):      2      ---
Thresh15MinFailedFast              :           0      ---
Thresh15MinSes                    (sec):      0      0
Thresh15MinUas                    (sec):      0      0

```

### 54.5.2 Alarm Profile Set Command Example

The following example sets an alarm profile named SESalarm that has the IES-612-51 send an alarm trap and generate a syslog whenever the upstream connection's number of severely errored seconds exceeds three within a 15 minute period.

**Figure 170** Alarm Profile Set Command Example

```

ras> adsl alarmprofile set SESalarm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 0 3
0 0 0

```

### 54.5.3 Alarm Profile Delete Command Example

The following example deletes the SESalarm alarm profile.

**Figure 171** Alarm Profile Delete Command Example

```

ras> adsl alarm profile delete SESalarm

```

### 54.5.4 Alarm Profile Map Command Example

The following example sets the IES-612-51 to use the SESalarm alarm profile with ADSL port 5.

**Figure 172** Alarm Profile Map Command Example

```
ras> adsl alarmprofile map SESalarm 5
```

### 54.5.5 Alarm Profile Showmap Command Example

The following example displays which alarm profile the IES-612-51 is set to use for ADSL port 5.

**Figure 173** Alarm Profile Showmap Command Example

```
ras> adsl alarmprofile showmap 5
ADSL alarm profile mapping:
Port 5: Alarm Profile = DEFVAL
```



# Virtual Channel Commands

This chapter shows you how to use commands to configure virtual channels.

See [Section 13.8 on page 115](#) for background information on virtual channels and ATM QoS.

## 55.1 Virtual Channel Command Input Values

The following table describes the values required in Virtual Channel commands. Other values are discussed with the corresponding commands.

**Table 142** Virtual Channel Command Input Values

LABEL	DESCRIPTION
<i>cdvt</i>	Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay (measured in number of cells). Possible values are 0~255 or * (means 0).
<i>member-vci</i>	The VCI of the individual PVC that you are adding to a Permanent Virtual Circuit (PVC). The subscriber's device must create this PVC.
<i>member-vpi</i>	The VPI of the individual PVC that you are adding to a PPVC. The subscriber's device must create this PVC.
<i>pcr</i>	The Peak Cell Rate (150~300 000) is the maximum rate (measured in cells per second) at which the sender can send cells.
<i>portlist</i>	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<i>priority</i>	The priority level (0~7) assigned to PVC traffic. 7 is the highest priority.
<i>vc llc</i>	The type of encapsulation. VC Mux is a type of encapsulation where, by prior agreement, each protocol is assigned to a specific virtual circuit, for example, VC1 carries IP and VC2 carries IPX. LLC is a type of encapsulation where one VC carries multiple protocols with each packet header containing protocol identifying information.
<i>vcprofile, ds-vcprofile, us-vcprofile</i>	The name of the virtual channel profile (up to 31 ASCII characters). You can assign profiles for downstream and upstream virtual channels. You cannot change the DEFVAL or DEFVAL_VC profiles.

**Table 142** Virtual Channel Command Input Values

LABEL	DESCRIPTION
<i>vlan-id</i>	This is the VLAN Identifier (1 – 4094) added to routed Ethernet frames. Each PVC must have a unique <i>vlan-id</i> since the IES-612-51 forwards traffic back to the subscribers based on the VLAN ID.
<i>vpi, vci</i>	The Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) identify a channel on this port. Possible values for the VPI are 0~255. This PVC channel is for internal use. The subscriber does not need to create this PVC. Possible values for the VCI are 32~65535 if the VPI is 0. If the VPI is not 0, possible values for the VCI are 1~65535. This PVC channel is for internal use. The subscriber does not need to create this PVC.

## 55.2 Virtual Channel Profile Commands

Use the following commands to configure virtual channel profiles.

**Table 143** Virtual Channel Profile Commands

COMMAND	DESCRIPTION	P
<code>adsl vcprofile show [vcprofile]</code>	Displays the settings of the specified virtual channel profile (or all of them if you do not specify one).	L/L
<code>adsl vcprofile set &lt;vcprofile&gt; &lt;vc llc&gt;&lt;ubr cbr&gt;&lt;pcr&gt; &lt;cdvt&gt;</code>	Creates a virtual channel profile. <i>ubr cbr</i> : Specify either a unspecified bit rate (UBR) or constant bit rate (CBR).	H/H
<code>adsl vcprofile set &lt;vcprofile&gt; &lt;vc llc&gt;&lt;vbr(rt-vbr) nrt-vbr&gt; &lt;pcr&gt;&lt;cdvt&gt;&lt;scr&gt;&lt;bt&gt;</code>	Creates a virtual channel profile. After you create a virtual channel profile, you can assign it to any of the ADSL ports on any of the ADSL IES-612-51 in the IES-612-51. <i>vbr(rt-vbr) nrt-vbr</i> : The Real-Time Variable Bit Rate (RT-VBR) or Non Real-Time (NRT-VBR) Variable Bit Rate ATM traffic class. <i>pcr</i> : Peak Cell Rate (PCR) is the maximum rate (150 to 300000 cells per second) at which the sender can send cells. <i>cdvt</i> : Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay measured in number of cells. Enter from 0 to 255 or * (means 0). <i>scr</i> : The Sustained Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted (measured in cells per second). SCR applies to the VBR traffic class. <i>bt</i> : Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards (number of cells). BT applies to the VBR traffic class.	H/H
<code>adsl vcprofile delete &lt;vcprofile&gt;</code>	You cannot delete a virtual channel profile that is assigned to any of the ADSL ports. Assign a different profile to any ADSL ports that are using the profile that you want to delete, and then you can delete the profile.	H/H

## 55.2.1 Set Virtual Channel Profile Command

The following example creates a virtual channel profile named gold that uses LLC encapsulation. It uses constant bit rate and has the maximum rate (peak cell rate) set to 300,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells.

**Figure 174** Set Virtual Channel Profile Command Example 1

```
ras> adsl vcprofile set gold llc cbr 300000 5
```

The following example creates a virtual channel profile named silver that uses VC encapsulation. It uses real-time variable bit rate and has the maximum rate (peak cell rate) set to 250,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells. The average cell rate that can be transmitted (SCR) is set to 100,000 cells per second. The maximum number of cells that the port is guaranteed to handle without any discards (BT) is set to 200.

**Figure 175** Set Virtual Channel Profile Command Example 2

```
ras> adsl vcprofile set silver vc vbr 250000 5 100000 200
```

The following example creates a virtual channel profile named economy that uses LLC encapsulation. It uses unspecified bit rate and has the maximum rate (peak cell rate) set to 50,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 100 cells.

**Figure 176** Set Virtual Channel Profile Command Example 3

```
ras> adsl vcprofile set gold llc cbr 50000 100
```

## 55.2.2 Delete Virtual Channel Profile Command

The following example deletes the silver virtual channel profile.

**Figure 177** Delete Virtual Channel Profile Command Example

```
ras> adsl vcprofile delete silver
```

## 55.3 PVC Channels

Channels (also called Permanent Virtual Circuits or PVCs) let you set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them). Use the following commands to define channels.

**Table 144** PVC Commands

COMMAND	DESCRIPTION	P
<code>adsl pvc show</code> [<portlist>[<vpi><vci>]]	Displays the Permanent Virtual Circuit (PVC) parameters of the specified ADSL port(s) or all of the ADSL ports if you do not specify any.	M/L
<code>adsl pvc set</code> <portlist><vpi><vci><super  vlanid<priority>><ds- vcprofile[,us-vcprofile]>	Allows the configuration of a PVC (permanent virtual circuit) for one or a range of ADSL ports.  <i>super:</i> Enable the super channel option to allow a channel to forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The IES-612-51 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.	H/H
<code>adsl pvc delete</code> [<portlist>[<vpi><vci>]]	Deletes the specified PVC channel.	H/H

### 55.3.1 PVC Set Command

The following example sets a PVC on ADSL port 1 with VPI 1, VCI 34, default VID 100 and priority 3. It sets the “platinum” profile for downstream traffic shaping and a VC profile named “plus” for upstream traffic policing.

**Figure 178** PVC Set Command Example

```
ras> adsl pvc set 1 1 34 100 3 platinum,plus
```

## 55.4 Priority-based PVCs

A PPVC (Priority-based PVC) allows you to give different priorities to PVCs that are members of the same VLAN.

The IES-612-51 uses eight priority queues (also called levels) for the member PVCs. The system maps frames with certain IEEE 802.1p priorities to a PVC with a particular priority queue. See [Table 169 on page 391](#) for the factory default mapping.

Use these commands to configure PPVCs and add and remove member PVCs..

**Table 145** PPVC Commands

COMMAND	DESCRIPTION	P
adsl ppvc set <portlist><vpi> <vci><llc vc><pvid><priority>	Creates a Priority PVC (PPVC). This allows you to give different priorities to PVCs that are members of the same VLAN.	H/H
adsl ppvc member set <portlist> <vpi><vci><member-vpi><member-vci><ds-vcprofile[,us-vcprofile]><priority>	Adds a member PVC to a PPVC. You must create the PPVC before you use this command to add a member.  <b>Note:</b> Only the member PVCs need to be created on the subscriber's device.	H/H
adsl ppvc member delete <portlist><vpi><vci><member-vpi><member-vci>	Removes a PVC from a PPVC.	H/H
adsl ppvc member show [<portlist> [<vpi><vci>]]	Displays the PVCs that are members of a PPVC.	M/L
adsl ppvc show [<portlist> [<vpi><vci>]]	Displays the runtime configured PPVCs.	M/L
adsl ppvc delete <portlist> <vpi><vci>	Removes a PPVC. Removing a PPVC also deletes all of the member PVCs.	H/H

### 55.4.1 PPVC Set Command Example

The following example creates a PPVC with VPI 8 and VCI 35 for port 5. The PPVC uses llc encapsulation and default VID 25. Any frames received without an IEEE 802.1p priority tag will be assigned a priority of 3. The IES-612-51 uses this PVC channel internally. This PVC is not needed on the subscriber's device.

**Figure 179** PPVC Set Command Example

```
ras> adsl ppvc set 5 8 35 llc 25 3
```

### 55.4.2 PPVC Member Set Command Example

The following example adds a PVC to a PPVC with VPI 8 and VCI 35 for port 5. The PVC uses VPI 8 and VCI 36. It sets the DEFVAL profile for downstream traffic shaping and for upstream traffic policing. It uses priority queue 2.

**Figure 180** PPVC Member Set Command Example

```
ras> adsl ppvc member set 5 8 35 8 36 DEFVAL,DEFVAL 2
```

### 55.4.3 PPVC Member Delete Command Example

The following example removes a PVC that uses VPI 8 and VCI 36 from a PPVC with VPI 8 and VCI 35 for port 5.

**Figure 181** PPVC Member Delete Command Example

```
ras> adsl ppvc member delete 5 8 35 8 36
```

### 55.4.4 PPVC Member Show Command Example

The following example displays the PVCs that are members of a PPVC for port 5.

**Figure 182** PPVC Member Show Command Example

```
ras> adsl ppvc member show 5
port vpi   vci mvpi   mvci   level DS/US vcprofile
-----
   5    8   35    8    36      2 DEFVAL/DEFVAL
```

### 55.4.5 PPVC Show Command Example

The following example displays the PPVCs configured on DSL port 5.

**Figure 183** PPVC Show Command Example

```
ras> adsl ppvc show 5
port vpi   vci  encap pvid pri
=====
   5    8   35   llc   25  6
```

### 55.4.6 PPVC Delete Command Example

The following example removes a PPVC with VPI 8 and VCI 35 for port 5.

**Figure 184** PPVC Delete Command Example

```
ras> adsl ppvc delete 5 8 35
```

## 55.5 2684 Routed Mode Commands

Use the 2684 routed mode to have the IES-612-51 add MAC address headers to 2684 routed mode traffic from a PVC that connects to a subscriber device that uses 2684 routed mode. You can also specify the gateway to which the IES-612-51 sends the traffic and the VLAN ID tag to add. See RFC-2684 for details on routed mode traffic carried over AAL type 5 over ATM.

Use the commands in the following order to set up a 2684 routed mode PVC.

- 1 Use the `adsl rpvc gateway` commands to configure gateway settings.
- 2 Use the `adsl rpvc set` command to configure RPVCs (2684 routed mode PVCs) for 2684 routed mode traffic.

- 3 Use the `adsl rpvc route set` command to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE or Customer Premises Equipment). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.
- 4 Use the `adsl rpvc arp` commands to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.
- 5 For upstream traffic: Since the subscriber's device will not send out a MAC address, after the IES-612-51 reassembles the Ethernet packets from the AAL5 ATM cells, the IES-612-51 will append the routed mode gateway's MAC address and the IES-612-51's MAC address as the destination/source MAC address.

For downstream traffic: When the IES-612-51 sees the destination IP address is specified in the RPVC (or RPVC domain), the IES-612-51 will strip out the MAC header and send them to the corresponding RPVC.

**Table 146** RPVC Commands

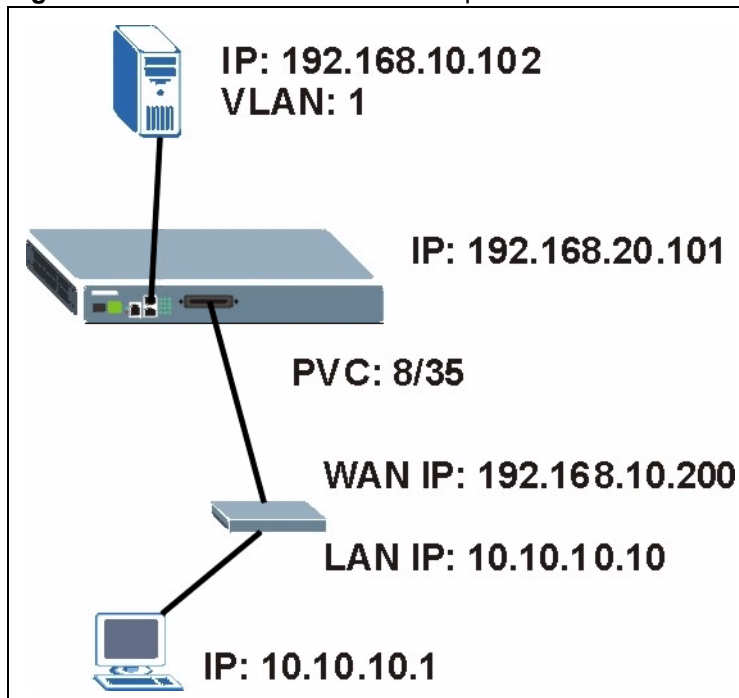
COMMAND	DESCRIPTION	P
<code>adsl rpvc gateway set &lt;gateway-ip&gt;&lt;vlan-id&gt;[&lt;priority&gt;]</code>	Adds a gateway IP address to use for 2684 routed mode traffic.	H/H
<code>adsl rpvc gateway show</code>	Displays the gateway IP addresses that are configured for use with 2684 routed mode traffic.	M/L
<code>adsl rpvc gateway delete &lt;gateway-ip&gt;</code>	Removes the gateway IP address that the device was set to use for 2684 routed mode traffic.	H/H
<code>adsl rpvc set &lt;portlist&gt;&lt;vpi&gt; &lt;vci&gt;&lt;ds-vcprofile[,us-vcprofile]&gt; &lt;ip&gt;/&lt;mask&gt; &lt;gateway-ip&gt;</code>	This command adds a PVC to handle 2684 routed mode traffic. Make sure that the routed PVC's subnet does not include the IES-612-51's IP address.  <b>Note:</b> You must use the <code>rpvc gateway set</code> command to configure the gateway's settings before you use the <code>rpvc set</code> command.	H/H
<code>adsl rpvc show &lt;portlist&gt;</code>	This command lists the PVCs for handling 2684 routed mode traffic (RPVCs).	M/L
<code>adsl rpvc delete &lt;portlist&gt;&lt;vpi&gt;&lt;vci&gt;</code>	Removes the specified PVC for 2684 routed mode traffic.	H/H
<code>adsl rpvc route set &lt;port&gt;&lt;vpi&gt; &lt;vci&gt;&lt;ip&gt;/&lt;mask&gt;</code>	Sets RPVC route on a port.	H/H
<code>adsl rpvc route show &lt;portlist&gt;</code>	This command lists the domains for 2684 routed mode traffic.	M/L
<code>adsl rpvc route delete &lt;port&gt; &lt;vpi&gt;&lt;vci&gt;&lt;ip&gt;/&lt;mask&gt;</code>	Removes the specified domain for 2684 routed mode traffic. The domain includes the subscriber's LAN IP addresses.	H/H
<code>adsl rpvc arp agingtime set &lt;sec&gt;</code>	Configures how long the device stores the IP addresses of CPE devices using 2684 routed mode in the Address Resolution Protocol table.  <i>sec:</i> The number of seconds (10~10000) the device is to keep the Address Resolution Protocol table's entries of IP addresses of 2684 routed mode gateways. Use 0 to disable the aging time.	H/H

**Table 146** RPVC Commands

COMMAND	DESCRIPTION	P
<code>adsl rpvc arp agingtime show</code>	Displays how long the device stores the IP addresses of 2684 routed mode gateways in the Address Resolution Protocol table.	M/L
<code>adsl rpvc arp show</code>	Displays how long the device stores the IP addresses of 2684 routed mode gateways in the Address Resolution Protocol table.	M/L
<code>adsl rpvc arp flush</code>	Clears the IP addresses of 2684 routed mode gateways from the Address Resolution Protocol table.	H/H

### 55.5.1 2684 Routed Mode Example

The following figure shows an example RFC 2684 (formerly RFC 1483) routed mode set up. The gateway server uses IP address 192.168.10.102 and is in VLAN 1. The IES-612-51 uses IP address 192.168.20.101. The subscriber's device (the CPE) is connected to DSL port 1 on the IES-612-51 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's WAN IP address is 192.168.10.200. The routed domain is the LAN IP addresses behind the CPE device. The CPE device's LAN IP address is 10.10.10.10 and the LAN computer's IP address is 10.10.10.1. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

**Figure 185** 2684 Routed Mode Example

Note the following.

- The CPE device's WAN IP (192.168.10.200 in this example) must be in the same subnet as the gateway's IP address (192.168.10.102 in this example).
- The IES-612-51's management IP address can be any IP address, it doesn't have any relationship to the WAN IP address or routed gateway IP address.



- The IES-612-51's management IP address should not be in the same subnet as the one defined by the WAN IP address and netmask of the subscriber's device. It is suggested that you set the netmask of the subscriber's WAN IP address to 32 to avoid this problem.
- The IES-612-51's management IP address should not be in the same subnet range of any RPVC and RPVC domain. It will make the IES-612-51 confused if the IES-612-51 receives a packet with this IP as destination IP.
- The IES-612-51's management IP address also should not be in the same subnet as the one defined by the LAN IP address and netmask of the subscriber's device. Make sure you assign the IP addresses properly.
- In general deployment, the computer must set the CPE device's LAN IP address (10.10.10.10 in this example) as its default gateway.
- The subnet range of any RPVC and RPVC domain must be unique.

Use the following command sequence to configure the IES-612-51 for this example set up.

**Figure 186** 2684 Routed Mode Commands Example

```

ras> adsl rpvc gateway set 192.168.10.102 1
ras> adsl rpvc set 1 8 35 DEFVAL 192.168.10.200/32 192.168.10.102
ras> adsl rpvc route set 1 8 35 10.10.10.1/24

```

## 55.5.2 RPVC Gateway Set Command Example

The following example has the device use a VLAN ID of 1 and IEEE 802.1p priority of 3 when sending 2684 routed mode traffic to a gateway at IP address 192.168.10.102.

**Figure 187** RPVC Gateway Set Command Example

```

ras> adsl rpvc gateway set 192.168.10.102 1 3

```

## 55.5.3 RPVC Gateway Show Command Example

The following is an example.

**Figure 188** RPVC Gateway Show Command Example

```

ras> adsl rpvc gateway show
gateway ip      vid
-----
192.168.10.102  1

```

## 55.5.4 RPVC Gateway Delete Command Example

The following example has the device remove a 2684 routed mode traffic gateway entry for IP address 192.168.10.102.

**Figure 189** RPVC Gateway Delete Command Example

```

ras> adsl rpvc gateway delete 192.168.10.102

```

### 55.5.5 RPVC Set Command Example

The following example adds a PVC for 2684 routed mode traffic. It is for DSL port 1, VPI 8, VCI 35. It sets the DEFVAL profile for downstream traffic shaping and for upstream traffic policing. The CPE device's WAN IP address is 192.168.10.200 with a netmask of 32 and the gateway's IP address is 192.168.10.102.

**Figure 190** RPVC Set Command Example

```
ras> adsl rpvc set 1 8 35 DEFVAL,DEFVAL 192.168.10.200/32 192.168.10.102
```

### 55.5.6 RPVC Show Command Example

The following example displays the RPVCs for DSL port 1.

**Figure 191** RPVC Show Command Example

```
ras> adsl rpvc show 1
port vpi vci ip/netmask gateway ip DS/US vcprofile
-----
1 8 35 192.168.10.200/32 192.168.10.102 DEFVAL/DEFVAL
```

### 55.5.7 RPVC Delete Command Example

The following example removes a PVC for 2684 routed mode traffic. It is for DSL port 1, VPI 8, VCI 35.

**Figure 192** RPVC Delete Command Example

```
ras> adsl rpvc delete 1 8 35
```

### 55.5.8 RPVC Route Set Command Example

The following example adds a domain for a CPE device is connected to DSL port 1 on the IES-612-51 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's LAN IP address is 10.10.10.10 and uses a subnet mask of 255.255.255.0. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

**Figure 193** RPVC Route Set Command Example

```
ras> adsl rpvc route set 1 8 35 10.10.10.1/24
```

### 55.5.9 RPVC Route Show Command Example

The following example displays the domains for 2684 routed mode traffic for devices connected to DSL ports 1 and 2.

**Figure 194** RPVC Route Show Command Example

```

ras> adsl rpvc route show 1,2
port vpi vci ip/netmask
-----
  1   8   35 10.10.10.0/24
  2   8   35 10.10.11.0/24

```

### 55.5.10 RPVC Route Delete Command Example

The following example removes a domain for a CPE device is connected to DSL port 1 on the IES-612-51 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's LAN IP address is 10.10.10.10 and uses a subnet mask of 255.255.255.0. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

**Figure 195** RPVC Route Delete Command Example

```

ras> adsl rpvc route delete 1 8 35 10.10.10.1/24

```

### 55.5.11 RPVC ARP Agingtime Set Command Example

The following example sets the device to store the IP addresses 2684 routed mode gateways in the Address Resolution Protocol table for 500 seconds.

**Figure 196** RPVC ARP Agingtime Command Example

```

ras> adsl rpvc arp agingtime set 500

```

### 55.5.12 RPVC ARP Agingtime Show Command Example

The following is an example.

**Figure 197** RPVC ARP Agingtime Show Command Example

```

ras> adsl rpvc arp agingtime show
rpvc aging time (sec): 500

```

### 55.5.13 RPVC ARP Show Command Example

The following is an example.

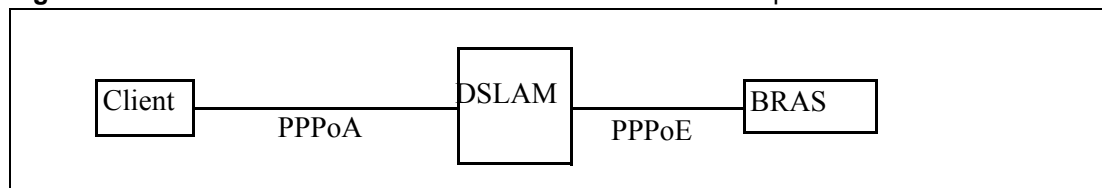
**Figure 198** RPVC ARP Agingtime Show Command Example

```
ras> adsl rpvc arp show
gateway ip      vid  mac
-----
192.168.10.102  1  00:0d:9d:d9:43:3b
```

## 55.6 PPPoA to PPPoE (PAE) Translation

Before migrating to an Ethernet infrastructure, a broadband network might consist of PPPoA connections between the CPE devices and the DSLAM and PPPoE connections from the DSLAM to the BRAS (Broadband Remote Access Server). The following figure shows a network example.

**Figure 199** Mixed PPPoA-to-PPPoE Broadband Network Example



In order to allow communication between the end points (the CPE clients and the BRAS), you need to configure the DSLAM (the IES-612-51) to translate PPPoA frames to PPPoE packets and vice versa.

When PPPoA packets are received from the CPE, the ATM headers are removed and the IES-612-51 adds PPPoE and Ethernet headers before sending the packets to the BRAS. When the IES-612-51 receives PPPoE packets from the BRAS, PPPoE and Ethernet headers are stripped and necessary PVC information (such as encapsulation type) is added before forwarding to the designated CPE.

You can use these commands to create PVCs for PAE translation.

**Table 147** PAEPVC Commands

COMMAND	DESCRIPTION	P
adsl paepvc delete <portlist> <vpi><vci>	This command removes a PPPoA-to-PPPoE (PAE) PVC.	M/H
adsl paepvc set <portlist><vpi> <vci><ds-vcprofile[,us-vcprofile]><pvid><priority> [acname] [srvcname] [hellotime]	Creates a PAE PVC to allow communication between the ATM (CPE) and Ethernet network (BRAS) segments. The PVC is mapped to a PPPoE session that connects to the specified BRAS (Broadband Remote Access Server).  <i>acname</i> : Specifies the hostname of a remote access concentrator if there are two access concentrators (or BRAS) on the network or that you want to allow PAE translation to the specified access concentrator.  <i>srvcname</i> : Specifies the name of the service that uses this PVC. This must be a service name that you configure on the remote access concentrator.  <i>hellotime</i> : Specifies the timeout, (0~600 seconds) for the PPPoE session. Enter 0 if there is no timeout.	M/H
adsl paepvc show [<portlist>[<vpi><vci>]]	Displays the PAE PVC settings for the specified port(s) or PVCs.	L/L
adsl paepvc session <portlist> [<vpi><vci>]	This command displays the status of PAE PVC sessions on the specified port(s) or PVCs.	L/L
adsl paepvc counter <portlist> [<vpi><vci>]	This command displays statistics about PAE PVC activity.	L/L

### 55.6.1 PAE PVC Set Command Example

The following example creates a PPPoA-to-PPPoE PVC (1/33) for port 1. The VLAN ID is 1, and the IEEE 802.1p priority is 0. This configuration is for the `video` service on the `vom` access concentrator. The switch waits 10 seconds before terminating the PPPoE session.

**Figure 200** PAE PVC Set Command Example

```
ras> adsl paepvc set 1 1 33 DEFVAL 1 0 acname vom srvcname video hellotime 10
```

### 55.6.2 PAE PVC Show Command Example

The following example displays the settings for port 1.

**Figure 201** PAE PVC Show Command Example

```
ras> adsl paepvc show 1
port vpi   vci pvid pri htime US/DS vcprofile/acname/srvcname
-----
  1    1    33   1   0   10 dsprofile: DEFVAL
                                usprofile:
                                acname   : vom
                                srvcname  : video
```

### 55.6.3 PAE PVC Session Command Example

The following example displays the settings for port 1.

**Figure 202** PAE PVC Session Command Example

```

ras> adsl paepvc session 1
pvc 1-1/33
session state : down
session id    : 0
session uptime: 0 secs
acname       :
srvcname     :

```

### 55.6.4 PAE PVC Counter Command Example

The following example displays the statistics for port 1.

**Figure 203** PAE PVC Counter Command Example

```

ras> adsl paepvc counter 1
pvc 1-1/33

```

	tx	rx
ppp lcp config-request :	-	0
ppp lcp echo-request   :	-	0
ppp lcp echo-reply     :	-	0
pppoe padi             :	0	-
pppoe pado             :	-	0
pppoe padr             :	0	-
pppoe pads             :	-	0
pppoe padt             :	0	0
pppoe srvcname error   :	-	0
pppoe ac system error  :	-	0
pppoe generic error    :	0	0

Each value is described below.

tx/rx	=	The values in these columns are for packets transmitted (tx) or received (rx) by the IES-612-51.
ppp lcp config-request	=	The number of config-request PDUs received by the IES-612-51 from the CPE (client) device.
ppp lcp echo-request	=	The number of echo-request PDUs received by the IES-612-51 from the CPE (client) device.
ppp lcp echo-reply	=	The number of echo-reply PDUs received by the IES-612-51 from the CPE (client) device.
pppoe padi	=	The number of padi PDUs sent by the IES-612-51 to the BRAS.
pppoe pado	=	The number of pado PDUs sent by the BRAS to the IES-612-51.
pppoe padr	=	The number of padr PDUs sent by the IES-612-51 to the BRAS.

<code>pppoe pads</code>	=	The number of pads PDUs sent by the BRAS to the IES-612-51.
<code>pppoe padt</code>	=	The number of padt PDUs sent and received by the IES-612-51.
<code>pppoe srvcname error</code>	=	The number of service name errors; for example, the IES-612-51's specified service is different than the BRAS's setting.
<code>pppoe ac system error</code>	=	The number of times the access concentrator experienced an error while performing the Host request; for example, when resources are exhausted in the access concentrator. This value does not include the number of times the IES-612-51 checks the AC name field in the BRAS's reply PDU and finds a mismatch, however.
<code>pppoe generic error</code>	=	The number of other types of errors that occur in the PPPoE session between the IES-612-51 and the BRAS.

## 55.7 Transparent LAN Service (TLS)

Transparent LAN Services (also known as VLAN stacking or Q-in-Q) allows a service provider to distinguish multiple customers VLANs, even those with the same (customer-assigned) VLAN ID, within its network.

Use TLS to add an outer VLAN tag to the inner IEEE 802.1Q tagged frames that enter the network. By tagging the tagged frames ("double-tagged" frames), the service provider can manage up to 4,094 VLAN groups with each group containing up to 4,094 customer VLANs. This allows a service provider to provide different services, based on specific VLANs, for many different customers.

A service provider's customers may require a range of VLANs to handle multiple applications. A service provider's customers can assign their own inner VLAN tags to traffic. The service provider can assign an outer VLAN tag for each customer. Therefore, there is no VLAN tag overlap among customers, so traffic from different customers is kept separate.

Before the IES-612-51 sends the frames from the customers, the VLAN ID is added to the frames. When packets intended for specific customers are received on the IES-612-51, the outer VLAN tag is removed before the traffic is sent.

See [Chapter 30 on page 211](#) for an example.



You can NOT configure PPPoA-to-PPPoE and TLS settings on the same PVC.

**Table 148** TLS Commands

COMMAND	DESCRIPTION	P
<code>adsl tlspvc delete</code> <code>&lt;portlist&gt;&lt;vpi&gt;&lt;vci&gt;</code>	Clears Transparent LAN Services (TLS) settings for the PVC.	M/H
<code>adsl tlspvc set</code> <code>&lt;portlist&gt;&lt;vpi&gt;&lt;vci&gt;&lt;ds-</code> <code>vcprofile[,us-</code> <code>vcprofile]&gt;&lt;pvid&gt;&lt;priority&gt;</code>	Uses TLS to add an outer VLAN tag to the inner IEEE 802.1Q tagged frames that enter the network. By tagging the tagged frames ("double-tagged" frames) the service provider can manage up to 4094 VLANs groups with each group containing up to 4094 customer VLANs. This allows a service provider to provide different services, based on specific VLANs, for many different customers. Sets untagged traffic with a tag including the specified VLAN ID and priority. If traffic is already tagged, this command adds a tag with the specified VLAN ID and the original priority setting for the traffic, not the priority setting specified in the command.	M/H
<code>adsl tlspvc show</code> <code>[&lt;portlist&gt;[&lt;vpi&gt;&lt;vci&gt;]]</code>	Displays the TLS settings for the specified port(s) or PVC(s).	L/L

### 55.7.1 TLS PVC Set Command Example

The following example adds VLAN tag 100 to traffic using the DEFVAL ATM profile on PVC (1/33) on port 2.

**Figure 204** TLS PVC Set Command Example

```
ras> adsl tlspvc set 2 1 33 DEFVAL 100 0
```

### 55.7.2 TLS PVC Show Command Example

**Figure 205** TLS PVC Show Command Example

```
ras> adsl tlspvc show 2
port vpi   vci   pvid pri DS/US vcprofile
-----
  2    1    33   100  0 DEFVAL
```



# ACL Commands

An ACL (Access Control Logic) profile allows the system to classify and perform actions on the upstream traffic. Use the ACL Profile commands to set up ACL profiles and the ACL Assignment commands to apply them to PVCs.

## 56.1 ACL Profile Commands

Use these commands to set up ACL profiles.

The following table describes common required values in ACL commands. Other values are discussed with the corresponding commands.

**Table 149** ACL Command Input Values

LABEL	DESCRIPTION
<i>name</i>	The name of the ACL profile.
<i>rule</i>	The rule that classifies traffic flows.
<i>action</i>	One or more actions to perform on the classified packets. You can select one or more of the following actions. <i>rate</i> < <i>rate</i> > = Sets the transmission rate (1~65535 in kbps) for the matched traffic. <i>rvlan</i> < <i>rvlan</i> > = Replaces the VLAN ID with this VLAN ID (1~4094). <i>rpri</i> < <i>rpri</i> > = Replaces the priority with this priority (0 ~7) of the matched packets. <i>deny</i> = Drops the packets.

The following is a list of the ACL commands.

**Table 150** ACL Commands

COMMAND	DESCRIPTION	P
<pre>switch acl profile set &lt;name&gt; &lt;rule&gt; &lt;action&gt;</pre>	<p>Configures an ACL rule to classify the upstream traffic and perform action(s) on the classified traffic.</p> <p>Here are the criteria you can configure for rules in ACL profiles. The rules are listed in sequence from highest priority to lowest priority. The criteria within a rule are position-independent.</p> <pre>etype &lt;etype&gt; vlan &lt;vlan-id&gt; etype &lt;etype&gt; smac &lt;mac-address&gt; etype &lt;etype&gt; dmac &lt;mac-address&gt; vlan &lt;vlan-id&gt; smac &lt;mac-address&gt; vlan &lt;vlan-id&gt; dmac &lt;mac-address&gt; smac &lt;mac-address&gt; dmac &lt;mac-address&gt; vlan &lt;vlan-id&gt; priority &lt;priority&gt; etype &lt;etype&gt; vlan &lt;vlan-id&gt; smac &lt;mac-address&gt; dmac &lt;mac-address&gt; priority &lt;priority&gt; protocol &lt;protocol&gt; srcip &lt;ip-address&gt;/&lt;mask-bits&gt; [dstip &lt;ip-address&gt;/&lt;mask-bits&gt; [tos &lt;tos&gt; [srcport &lt;sport&gt; &lt;eport&gt; [dstport &lt;sport&gt; &lt;eport&gt;]]]]</pre> <p>where</p> <p>etype &lt;etype&gt; = Ethernet type (0~65535).</p> <p>vlan &lt;vlan-id&gt; = VLAN ID (1~4094).</p> <p>smac &lt;mac-address&gt; = Source MAC address.</p> <p>dmac &lt;mac-address&gt; = Destination MAC address.</p> <p>priority &lt;priority&gt; = Priority (0 ~ 7)</p> <p>protocol &lt;protocol&gt; = Protocol type: tcp, udp, ospf, igmp, ip, gre, icmp or user specified IP protocol number &lt;0 ~ 255&gt;.</p> <p>srcip &lt;ip-address&gt;/&lt;mask-bits&gt; = Source IP address and subnet mask (0~32).</p> <p>dstip &lt;ip-address&gt;/&lt;mask-bits&gt; = Destination IP address and subnet mask (0~32).</p> <p>tos &lt;stos&gt; &lt;etos&gt; = Sets the ToS (Type of Service) range between 0 and 255.</p> <p>srcport &lt;sport&gt; &lt;eport&gt; = Source port range (0~65535).</p> <p>dstport &lt;sport&gt; &lt;eport&gt; = Destination port range (0~65535).</p> <p>The following guidelines apply to classifiers.</p> <p>You can apply one classifier for a protocol on a port's PVC.</p> <p>You cannot create a classifier that contains matching criteria for layer 2 and layer 3 fields. For example <code>switch acl profile set test protocol tcp vlan 15 deny</code> is not allowed as protocol type and VLAN do not belong to the same network layer.</p> <p>Each type of criteria can only be used once in a classifier. For example, <code>profile acl set test protocol tcp protocol udp deny</code> is not allowed. For this example, you need to create a separate classifier for each protocol and apply them to the same PVC(s).</p>	M/H
<pre>switch acl profile delete &lt;name&gt;</pre>	<p>This command removes the specified ACL profile. You cannot remove an ACL profile that is currently in use.</p>	M/H

**Table 150** ACL Commands

COMMAND	DESCRIPTION	P
<code>switch acl profile showmap &lt;name&gt;</code>	Displays the DSL port(s) to which the specified ACL profile is applied.	L/L
<code>switch acl profile show [&lt;name&gt;]</code>	Lists the names of every ACL profile or displays the detailed settings of the specified ACL profile.	L/L

### 56.1.1 ACL Profile Set Command Example

This example creates an ACL rule example named `test` for traffic from VLAN 10 with a priority level of 2. This rule limits the rate on the classified traffic to 1000 kbps and changes the priority level to 7.

```
ras> switch acl profile set test vlan 10 priority 2 rate 1000 rpri 7
```

### 56.1.2 ACL Profile Show Map Command Example

This example displays the port mapping table for the “test” ACL profile.

```
ras> switch acl profile showmap test
profile: test
port type  vpi  vci
---- -
```

### 56.1.3 ACL Profile Show Command Example

This example displays the detailed settings of the “test” ACL profile.

```
ras> switch acl profile show test
profile test:
rule:
  vlan    :10
  priority:2

action:
  rpri    :7
  rate    :1000
```

## 56.2 ACL Assignment Commands

Use these commands to apply ACL profiles to PVCs.

The following table describes common required values in ACL assignment commands. Other values are discussed with the corresponding commands.

**Table 151** ACL Assignment Command Input Values

LABEL	DESCRIPTION
<port-list>	The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	The VPI of the PVC.
<vci>	The VCI of the PVC.
<profile>	The name of the ACL profile.

The following is a list of the ACL assignment commands.

**Table 152** ACL Assignment Commands

COMMAND	DESCRIPTION	P
switch acl set <port-list> <vpi> <vci> <profile>	Applies an ACL profile to the specified port(s). You can apply up to eight profiles to a subscriber port.	M/H
switch acl delete <port-list> <vpi> <vci> <profile>	Removes an ACL profile from the specified PVC.	M/H
switch acl show [<port-list>] [<vpi> <vci>]	Displays the ACL profiles currently applied to the specified PVC(s).	L/L

### 56.2.1 ACL Assignment Set Command Example

This example applies the ACL profile “test” to a PVC.

```
ras> switch acl set 1 0 33 test
```

### 56.2.2 ACL Assignment Show Command Example

This example displays the ACL profiles applied to the ACL profile “test”.

```
ras> switch acl show
port vpi    vci type profile
----
  1     0    33 PVC  test
```

---

# PART VI

## Troubleshooting and Specifications

---

Troubleshooting (375)

Product Specifications (385)



# Troubleshooting

This chapter covers potential problems and possible remedies. After each problem description, some steps are provided to help you to diagnose and solve the problem.

## 57.1 The SYS LED Does Not Turn On

The SYS LED does not turn on.

**Table 153** SYS LED Troubleshooting

STEP	CORRECTIVE ACTION
1	Make sure the IES-612-51 is properly connected to the power supply and the power supply is operating normally.
2	Make sure you are using the correct power source. (See <a href="#">Table 166 on page 385.</a> )
3	The LED itself or the unit may be faulty; contact your vendor.

## 57.2 The ALM LED Is On

The **ALM** (alarm) LED lights when the IES-612-51 is overheated or the voltage readings are outside the tolerance levels.

**Table 154** ALM LED Troubleshooting

STEP	CORRECTIVE ACTION
1	Use the statistics monitor command to verify the cause of the alarm. See step 2 if the unit is overheated and step 3 if the voltages are out of the allowed ranges.
2	Ensure that the IES-612-51 is installed in a well-ventilated area. Keep the bottom, top and all sides clear of obstructions and away from the exhaust of other equipment.
3	If the voltage levels are outside the allowed range, take a screen shot of the statistics monitor command display and contact your vendor.

## 57.3 LAN Port LEDs Do Not Turn On

A LAN port's LEDs do not turn on.

**Table 155** 10/100 LED Troubleshooting

STEPS	CORRECTIVE ACTION
1	Check the <b>Speed Mode</b> settings in the <b>ENET Port Setup</b> screen. Make sure that the LAN port's connection speed is set to match that of the port on the peer Ethernet device.
2	Check the Ethernet cable and connections between the LAN port and the peer Ethernet device.
3	Make sure that the peer Ethernet device is functioning properly. If the Ethernet cable and peer Ethernet device are both OK and the LEDs still stay off, there may be a problem with the port. Contact the distributor.

## 57.4 LAN Port Data Transmission

The LAN port's LED is on, but data cannot be transmitted.

**Table 156** Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Make sure that the LAN port has the appropriate mode setting.
2	Make sure that the IES-612-51's IP settings are properly configured.
3	Check the VLAN configuration.
4	Ping the IES-612-51 from a computer behind the peer Ethernet device.
5	If you cannot ping, check the Ethernet cable and connections between the Ethernet port and the Ethernet switch or router.
6	Note: Check the switch mode. In daisychain mode, if you have a loop topology and enable RSTP, it is possible for RSTP to disable Ethernet port 1 (the uplink port).  Note: It is not recommended to use daisychain mode in a loop topology.

## 57.5 DSL Data Transmission

The DSL link is up, but data cannot be transmitted.

**Table 157** DSL Data Transmission Troubleshooting

STEPS	CORRECTIVE ACTION
1	Check the switch mode and port isolation settings. Check to see that the VPI/VCI and multiplexing mode (LLC/VC) settings in the subscriber's DSL modem or router match those of the DSL port. If the subscriber is having problems with a video or other high-bandwidth services, make sure the IES-612-51's DSL port's data rates are set high enough.
2	Check the VLAN configuration.
3	Ping the IES-612-51 from the computer behind the DSL modem or router.



**Table 157** DSL Data Transmission Troubleshooting (continued)

STEPS	CORRECTIVE ACTION
4	If you cannot ping, connect a DSL modem to a DSL port (that is known to work). If the DSL modem or router works with a different DSL port, there may be a problem with the original port. Contact the distributor.
5	If using a different port does not work, try a different DSL modem or router with the original port.

## 57.6 There Is No Voice on a DSL Connection

The IES-612-51 has internal splitters and CO side Telco-50 connectors that allow the telephone wiring used for DSL connections to also simultaneously carry normal voice conversations.

**Table 158** DSL Voice Troubleshooting

STEP	CORRECTIVE ACTION
1	Make sure the subscriber has a splitter properly installed.
2	Check the DSL line pin assignments shown in <a href="#">Section 58.5 on page 393</a> .
3	Check the telephone wire connections between the subscriber and the MDF(s).
4	Check the telephone wire and connections between the MDF(s) and <b>USER</b> port(s).
5	Check the telephone wire and connections between the MDF(s) and the <b>CO</b> connector(s). Check the connection from the MDF(s) to the telephone company or the PBX.
6	Check the telephone wire mapping on the MDF(s).
7	Make sure the in-house wiring works and is connected properly.
8	Repeat the steps above using a different DSL port.

## 57.7 Testing Wiring

Use the following tests if there is no voice.

Systematically test wiring using a functioning telephone to determine if there is a wiring problem. If the connection is good, the telephone will return a dial tone. Letters in the figure shown next indicate the systematic tests to be done. Suppose you're using installation scenario "B" as shown in the chapter on MDF connections. The logic for other scenarios should be similar.

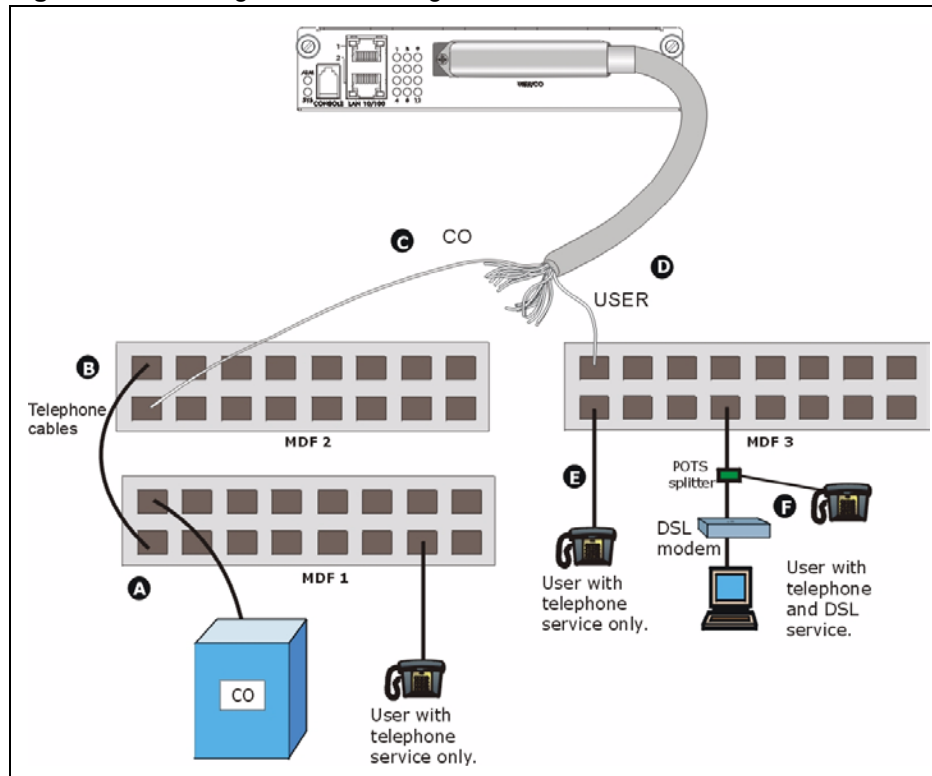
Use steps A-D if there is no voice but you can transmit data. Use all of the steps if there is no voice and you cannot transmit data.

**Table 159** Wiring Tests

TEST	DESCRIPTION
A.	Test A determines if there is a wiring problem between the TELCO (telephone company) and MDF 1.
B.	Test B determines if there is a wiring problem between MDF 1 and MDF 2.
C.	Test C determines if there is a wiring problem between MDF 2 and your device.
D.	Test D determines if there is a problem with your device's internal splitter.

**Table 159** Wiring Tests

TEST	DESCRIPTION
E.	Test E determines if there is a wiring problem between your device and MDF 3.
F.	Test F determines if there is a building-wiring problem between the subscriber's wall jack and MDF 3.

**Figure 206** Testing In-house Wiring**Table 160** Testing In-house Wiring

STEP	TEST
A	Connect a standard telephone to MDF 1. If there is no dial tone, then a problem with the wire or wire connections between MDF 1 and the TELCO exists. Contact your telephone company for troubleshooting.
B	Connect a telephone to the upper port of MDF 2. If there is no dial tone, then the problem is between MDF 1 and MDF 2. Check the telephone wire and connections between MDFs 1 and 2.
C	Disconnect the telephone wire from <b>CO</b> . Connect a telephone to the telephone wire. If there is no dial tone, then the problem is between your device and MDF 2. Check the telephone wire's pin assignments (see <a href="#">Section 58.5 on page 393</a> for the proper pin assignments). Replace the telephone wire if the pin assignments are OK and there is still no dial tone.
D	Reconnect the telephone wire to <b>CO</b> . Disconnect the telephone wire from <b>USER</b> . Connect a telephone to <b>USER</b> (see <a href="#">Section 58.5 on page 393</a> for the proper pin assignments). If there is no dial tone, your device's internal splitter may be faulty, contact your vendor.

**Table 160** Testing In-house Wiring (continued)

STEP	TEST
E	Reconnect the telephone wire to <b>USER</b> . Connect a telephone to a lower port of MDF 3. If there is no dial tone, then the problem is between your device and MDF 3. Check the pin assignments of the telephone wire's connector that connects to <b>USER</b> . Replace the telephone wire connecting your device to MDF 3. If there is no dial tone, then MDF 3 may be faulty. Contact the telephone company if that is the case.
F	Disconnect the DSL modem from the wall jack and connect the telephone to the wall jack. If there is no dial tone, then there is a problem with the building wiring between the DSL subscriber's home and the MDF. Contact your telephone company for troubleshooting.

## 57.8 Local Server

The computer behind a DSL modem or router cannot access a local server connected to the IES-612-51.

**Table 161** Troubleshooting a Local Server

STEPS	CORRECTIVE ACTION
1	See <a href="#">Section 57.5 on page 376</a> to make sure that the subscriber is able to transmit to the IES-612-51.
2	Make sure the computer behind the DSL device has the correct gateway IP address configured.
3	Check the VLAN configuration (see <a href="#">Chapter 16 on page 145</a> ).
4	Check the cable and connections between the IES-612-51 and the local server.
5	Try to access another local server. If data can be transmitted to a different local server, the local server that could not be accessed may have a problem.

## 57.9 Data Rate

The SYNC-rate is not the same as the configured rate.

**Table 162** Troubleshooting the SYNC-rate

STEPS	CORRECTIVE ACTION
1	Connect the DSL modem or router directly to the DSL port using a different telephone wire.
2	If the rates match, the quality of the telephone wiring that connects the subscriber to the DSL port may be limiting the speed to a certain rate. If they do not match when a good wire is used, contact the distributor.

## 57.10 Configured Settings

The configured settings do not take effect.

**Table 163** Troubleshooting the IES-612-51's Configured Settings

CORRECTIVE ACTION
Use the “config save” command after you finish configuring to save the IES-612-51's settings.

## 57.11 Password

If you forget your password, you will need to use the console port to reload the factory-default configuration file (see [Section 57.15 on page 381](#)).

## 57.12 System Lockout

Any of the following could also lock you and others out from using in-band management (managing through the data ports).

- 1 Deleting the management VLAN (default is VLAN 1).
- 2 Incorrectly configuring the CPU VLAN.
- 3 Incorrectly configuring the access control settings.
- 4 Disabling all ports.



Be careful not to lock yourself and others out of the system.

If you lock yourself (and others) out of the system, you can try using the console port to reconfigure the system. See [Section 57.15 on page 381](#).

## 57.13 SNMP

The SNMP manager server cannot get information from the IES-612-51.

**Table 164** Troubleshooting the SNMP Server

STEPS	CORRECTIVE ACTION
1	Ping the IES-612-51 from the SNMP server. If you cannot, check the cable, connections and IP configuration.
2	Check to see that the community (or trusted host) in the IES-612-51 matches the SNMP server's community.
3	Make sure that your computer's IP address matches a configured trusted host IP address (if configured).
4	Incorrectly configuring the access control settings may lock you out from using in-band management. Try using the console port to reconfigure the system.

## 57.14 Telnet

I cannot telnet into the IES-612-51.

**Table 165** Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Make sure that the number of current telnet sessions does not exceed the maximum allowed number. You cannot have more than five telnet sessions at one time.
2	Make sure that your computer's IP address matches a configured secured client IP address (if configured). The IES-612-51 immediately disconnects the telnet session if secured host IP addresses are configured and your computer's IP address does not match one of them.
3	Make sure that you have not disabled the Telnet service or changed the server port number that the IES-612-51 uses for Telnet.
4	Ping the IES-612-51 from your computer. If you are able to ping the IES-612-51 but are still unable to telnet, contact the distributor. If you cannot ping the IES-612-51, check the cable, connections and IP configuration.
5	Incorrectly configuring the access control settings may lock you out from using in-band management. Try using the console port to reconfigure the system.

## 57.15 Resetting the Defaults

If you lock yourself (and others) from the IES-612-51, you will need to reload the factory-default configuration file. Uploading the factory-default configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all previous configurations and the speed of the console port will be reset to the default of 9600 bps with 8 data bit, no parity, one stop bit and flow control set to none. The user name will be reset to “admin” and the password will be reset to “1234” and the IP address to 192.168.1.1.

### 57.15.1 Resetting the Defaults Via Command

If you know the password, you can reload the factory-default configuration file via Command Line Interface (CLI) command. Use the following procedure.

- 1 Connect to the console port using a computer with terminal emulation software. See [Section 3.2.1 on page 50](#) for details.
- 2 Enter your password.
- 3 Type `config restore`.
- 4 Type `y` at the question “Do you want to restore default ROM file(y/n)?”
- 5 The IES-612-51 restarts.

**Figure 207** Resetting the Switch Via Command

```

ras> config restore

System will reboot automatically after restoring default configuration.
Do you want to proceed(y/n)? >
restoring configuration...
saving configuration to flash...

```

The IES-612-51 is now reinitialized with a default configuration file including the default user name of “admin” and the default password of “1234”.

### 57.15.2 Uploading the Default Configuration File

If you forget your password or cannot access the IES-612-51, you will need to reload the factory-default configuration file. Uploading the factory-default configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all previous configurations and the speed of the console port will be reset to the default of 9600 bps with 8 data bit, no parity, one stop bit and flow control set to none. The password will also be reset to “1234” and the IP address to 192.168.1.1.



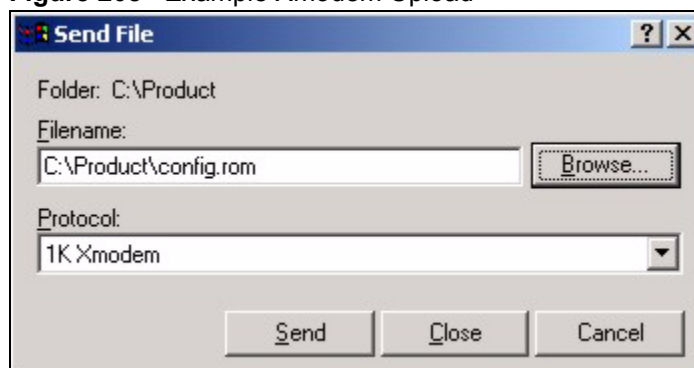
Uploading the factory default configuration file erases the IES-612-51’s entire configuration.

Obtain the default configuration file, unzip it and save it in a folder. Use a console cable to connect a computer with terminal emulation software to the IES-612-51’s console port. Turn the IES-612-51 off and then on to begin a session. When you turn on the IES-612-51 again you will see the initial screen. When you see the message `Press any key to enter Debug Mode within 3 seconds press any key to enter debug mode.`

To upload the configuration file, do the following:

- 1 Type `atlc` after the `Enter Debug Mode` message.
- 2 Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.
- 3 This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

**Figure 208** Example Xmodem Upload



Type the configuration file's location, or click **Browse** to search for it. Choose the **1K Xmodem** protocol. Then click **Send**.

- 4 After a successful configuration file upload, type `atgo` to restart the IES-612-51.

The IES-612-51 is now reinitialized with a default configuration file including the default password of “1234”.

## 57.16 Recovering the Firmware

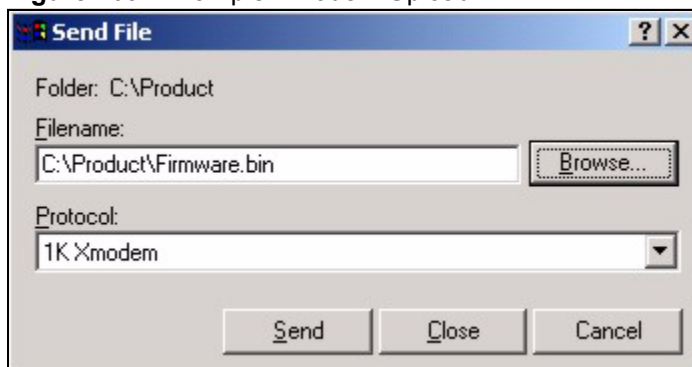
Usually you should use FTP or the web configurator to upload the IES-612-51's firmware. If the IES-612-51 will not start up, the firmware may be lost or corrupted. Use the following procedure to upload firmware to the IES-612-51 only when you are unable to upload firmware through FTP.



This procedure is for emergency situations only.

- 1 Obtain the firmware file, unzip it and save it in a folder on your computer.
- 2 Connect your computer to the console port and use terminal emulation software configured to the following parameters:
  - VT100 terminal emulation
  - 9600 bps
  - No parity, 8 data bits, 1 stop bit
  - No flow control
- 3 Turn off the IES-612-51 and turn it back on to restart it and begin a session.
- 4 When you see the message `Press any key to enter Debug Mode within 3 seconds`, press a key to enter debug mode.
- 5 Type `atba5` after the `Enter Debug Mode` message (this changes the console port speed to 115200 bps).
- 6 Change the configuration of your terminal emulation software to use 115200 bps and reconnect to the IES-612-51.
- 7 Type `atur` after the `Enter Debug Mode` message.
- 8 Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.
- 9 This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

**Figure 209** Example Xmodem Upload



Type the firmware file's location, or click **Browse** to search for it. Choose the **1K Xmodem** protocol. Then click **Send**.

- 10 After a successful firmware upload, type `atgo` to restart the IES-612-51. The console port speed automatically changes back to 9600 bps when the IES-612-51 restarts.





# Product Specifications

This chapter provides the specifications for the IES-612-51.

## 58.1 Device Specifications

The following tables summarize the IES-612-51's hardware features.

**Table 166** Hardware Specifications

FEATURE	DESCRIPTION
Dimensions	270 mm (W) x 350 mm (D) x 44.45 mm (H)
Weight	4.6 kg
Power Specification	DC: -36 V- -72 V, 25 W Max, 0.7 A Max AC: 100 V- 240 V, 50/60 Hz, 26 W Max, 0.7 A Max
Interface	<ul style="list-style-type: none"> <li>• 12 ADSL2+ Ports (Pin 1~12 and 26~37 for CO, Pin 14~25 and 39~50 for USER)</li> <li>• One console port for local management</li> <li>• Two 10/100BASE-T Ethernet ports for uplink</li> </ul>
Connectors	<ul style="list-style-type: none"> <li>• One Telco-50 female connector</li> <li>• mini RJ11 console port connector</li> <li>• Cat 5, 5e and 6 Ethernet cables</li> </ul>
Stacking	Daisy-chain three Ethernet devices recommended. Stacking more devices is possible.
Rackmounting	Mountable on a 19" rack.
Splitter	One integrated DSL splitter card for POTS.
LEDs	ALM, SYS, LAN 10/100 (1~2), ADSL ports (1~12)
Operating Environment	Temperature: 0° C ~ 50° C (AC version) 0° C ~ 60° C (DC version) Humidity: 10% ~ 90% RH (non-condensing)
Storage Environment	Temperature: -20° C ~ 70° C Humidity: 10% ~ 95% RH (non-condensing)
Ground Wire Gauge	18 AWG or larger
Power Wire Gauge	18 AWG or larger
Telephone Wire Gauge	26 AWG or larger

**Table 166** Hardware Specifications (continued)

FEATURE	DESCRIPTION
Fuse	<p><b>DC MODEL:</b>            Fuse specifications: 250 V 5A (DC Model)            Fuse dimensions: 5.2 mm (D) x 20 mm (L)            Fuse model name: CF RST250V2AL            Fuse vendor: BEL</p> <p><b>AC MODEL:</b></p> <p>Note: To be repaired only by ZyXEL personnel. Please contact your ZyXEL representative for more information. See <a href="#">Appendix C on page 403</a> for contact information.</p>
Fans	1 fan
Certifications	<p>RoHS            WEEE            Safety                UL 60950-1                CSA C22.2 No. 60950-1                EN60950-1, EN41003</p> <p>EMC                FCC Part 15 Class A                EN55022 Class A</p>

## 58.2 Firmware Features

This section introduces the IES-612-51 firmware features.

**Table 167** IES-612-51 Features

Basic Function	Power-On System Test (POST) Uplink Interface Fast Ethernet Thermal cutoff protection Temperature and voltage monitoring, and threshold setting
Management Interfaces	In-band Ethernet management One mini-RJ11 console port for local management

**Table 167** IES-612-51 Features (continued)

Management Features	<p>Embedded Web Configurator (HTTP)</p> <p>NetAtlas Element Management System (EMS)</p> <p>Command Line Interface (CLI): up to 5 concurrent sessions, 3 CI privilege levels and two Web privilege levels</p> <p>Telnet management</p> <p>Remote Management via Telnet, FTP, Web or SNMP: 2 ENET ports supported</p> <p>DSL profile function for managing DSL line card connections</p> <p>Firmware upgrade through web configurator, FTP and serial console port</p> <p>Text-based configuration file backup via FTP or Web</p> <p>IEEE 802.1X port-based authentication</p> <p>RADIUS client support for user's name and password</p> <p>UNIX syslog</p> <p>NTP (Network Time Protocol)</p> <p>IP ping</p> <p>SNMP: up to 4 SNMP trap hosts supported</p> <p>Database backup/restore</p> <p>Fault and alarm management</p> <p>Configuration management</p> <p>Performance counters</p> <p>Performance statistics (15m/24h)</p> <p>Event log</p> <p>Internal trace and debug</p>
Alarm, System Monitoring, Security and Logging	<p><b>Alarm</b></p> <p>Automatic alarm and status report</p> <p>Programmable alarm filters</p> <p>    Severity level configurable for each alarm</p> <p>    Threshold levels configurable per port</p> <p>LED indication of alarm state</p> <p>Alarm event list</p> <p>    Current alarm events</p> <p>    Alarm history</p> <p>Alarm cut-off feature</p> <p><b>System Monitoring</b></p> <p>Regular DSL performance counter update</p> <p>Watchdog support</p> <p>Hardware Monitoring</p> <p><b>Security</b></p> <p>Login Authorization</p> <p>IEEE 802.1x port-based authentication (local profile, RADIUS)</p> <p>VLAN</p> <p>Port Isolation (port security)</p> <p>Flooding (storm) control</p> <p><b>Logging</b></p> <p>External UNIX syslog server supported</p> <p>Log retention during re-booting (256 records)</p>

**Table 167** IES-612-51 Features (continued)

ADSL2/2+	<p>G.dmt (ITU-T G.992.1)  G.lite (ITU-T G.992.2)  G.hs (ITU-T G.994.1)  ANSI T1.413 issue 2  ADSL2: G.992.3, G.992.4  ADSL2+: G.992.5  Multiple Protocols over ADSL (RFC 2684, Bridged and Routed Mode)  LLC and VC MUX bridging (RFC 2684)  Power enhancement or ADSL power-saving mode  Rate adaptation (SRA)  PPPoE and PPPoA conversion  Multiple PVC support      PVC to VLAN mapping      Full range VCI/VPI  Monitoring of ADSL Line Quality  OAM F5 end-to-end loopback  DELT (Dual End Loop Test)  SELT (Single End Loop Test)</p>
SNMP Management	<p>SNMP Trap v1/v2c  SNMP agent  SNMP v1 (RFC 1157)  SNMPv2, SNMPv2c or later version  SMI (RFC 1155)</p>
MIBs	<p>SNMP MIB-II (RFC 1213)  Bridge MIBs (RFC 1493, 2674)  Ethernet MIB  Q MIB  ADSL line MIB (RFC 2662)  ADSL Extension Line MIB (RFC2449)  RMON MIB, group 1,2,3,9  ZyXEL proprietary MIBs</p>
VLAN	<p>VLAN entries: 256  VLAN - DSL Line mapping: map one DSL line (VPI/VCI) to one VLAN (maximum 256 VLANs supported)  Residential bridging: user to user traffic can be blocked  IEEE 802.1q Tag-based VLAN  GVRP (GARP VLAN Registration Protocol)  Transparent LAN Service (TLS) or IEEE 802.1ad Q-in-Q/VLAN stacking  Port Isolation  ADSL2/2+: accept tagged/untagged frame from CPE</p>
Quality of Service	<p>Traffic shaping  Bandwidth control  SPQ priority queuing:      SPQ - 4 queues per Ethernet port, 8 queues per DSL port  PVC-IEEE 802.1p mapping  DSCP-IEEE 802.1p mapping  Priority queuing based on physical port, VLAN details, source/destination MAC address, source/destination IP address, TCP/UDP port number, ToS and DSCP value  The priority queues are configurable based on the PVC ATM service types (UBR/ CBR /rt-VBR/nrt-VBR) to 802.1p priority mapping</p>

**Table 167** IES-612-51 Features (continued)

Layer 2 Bridging	<p>IEEE 802.1q VLAN aware bridging</p> <p><b>MAC addresses</b></p> <p>MAC address table: Up to 9.5K entries</p> <p>MAC addresses per port: Up to 128 addresses</p> <p>ARP Table: Up to 500 entries</p> <p>Automatic MAC address learning</p> <p>Configurable number of MAC addresses learned per port: 1~128</p> <p>MAC aging-out time</p> <p>Source MAC address filtering: 10 MAC addresses per port</p> <p>MAC anti-spoofing</p> <p><b>STP/RSTP</b></p> <p>IEEE 802.1d spanning tree protocol (STP)</p> <p>IEEE 802.1w rapid spanning tree protocol (RSTP)</p> <p>IEEE 802.1p priority queue mapping (static mapping)</p> <p><b>DHCP</b></p> <p>DHCP Snooping/ Anti-Spoofing</p> <p>DHCP relay</p> <p>Option 82 (globally)</p>
Multicast Features	<p>Static or dynamic (IGMP) multicast setting</p> <p>IGMP proxy</p> <p>IGMP snooping</p> <p>v1&amp;v2 (port based)</p> <p>IGMP filtering per DSL port</p> <p>IGMP bandwidth limiting per DSL port</p> <p>IGMP group count limiting per DSL port</p> <p>IGMP membership reports</p> <p>IGMP MVLAN (Multicast VLAN) support</p> <p>VLAN-aware IGMP snooping</p> <p>Static multicast groups: 256 each supporting 16 members</p> <p>Broadcast methodology</p> <p>Different video mapping to different VLANs</p> <p>Tracking IP address with IGMP</p>
ACL/Filtering	<p>Packet filtering - IP, PPoE, EAPoL, IGMP, DHCP, NetBIOS, ARP, ACL filtering</p> <p>ACL (Access Control Logic):</p> <ul style="list-style-type: none"> <li>14 possible rules and 4 possible actions</li> <li>8 ACL per PVC</li> </ul> <p>L2 frame filtering based on, for example, the source MAC address and port.</p> <p>L3 frame filtering based on, for example, the source IP address and IP protocol.</p> <p>Rate limiting per ADSL port</p> <p>Rate limiting per ADSL VC</p>

**Table 167** IES-612-51 Features (continued)

Per ADSL Port Provisioning	Number of ACL Profiles: 8 Number of DHCP snooping table entries: 32 Number of static DHCP snooping table entries: 32 Number of MAC filters: 10 Number of Joined MVLANs: 4 Number of PVCs (PVC, PPVC member, TLSPVC, PAEPVC): 8 Number of RPVC/RPVC routing entries: 8 Number of PPVCs: 2 Number of VLANs: 16 Number of IGMP groups per DSL port: 16 Number of IGMP host IP addresses per DSL port: 16 Number of IGMP host IP addresses per Ethernet port: 1024
System-wide Provisioning	Number of VLANs: 256 Number of ACL profiles: 128 Number of ADSL profiles: 24 Number of ATM profiles: 48 Number of IGMP filter profiles: 128 Number of ADSL alarm profiles: 24 Number of DHCP relay servers: 32 Number of IP routes: 128 Number of static multicast addresses: 32 Number of MVLAN: 16 Number of Multicast bandwidth control groups: 96 Number of IGMP groups: 256 groups Number of User (administrator) accounts: 16 Number of Dot1X profiles: 64 Number of MAC addresses learnable: 9.5k (128 per ADSL port, 4k per ENET port) Number of RPVC gateway IP addresses: 96

## 58.3 Standards Supported

The following list, which is not exhaustive, illustrates the standards supported in the IES-612-51.

**Table 168** Standards Supported

STANDARD	DESCRIPTION
RFC 867	Daytime Protocol
RFC 868	Time Protocol.
RFC 1112	IGMP v1
RFC 1157	SNMPv1: Simple Network Management Protocol version 1
RFC 1305	Network Time Protocol (NTP version 3)
RFC 1441	SNMPv2 Simple Network Management Protocol version 2
RFC 1483	Multiprotocol Encapsulation over ATM Adaptation Layer 5
RFC 1901	SNMPv2c Simple Network Management Protocol version 2c
RFC 2236	Internet Group Management Protocol, Version 2.
RFC 2364	PPP over AAL5 (PPP over ATM over ADSL)

**Table 168** Standards Supported (continued)

STANDARD	DESCRIPTION
RFC 2516	A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2684	Multiprotocol Encapsulation over ATM Adaptation Layer 5.
IEEE 802.11d	Standard for Local and Metropolitan Area Networks: Media Access Control (MAC) Bridges
IEEE 802.11x	Port Based Network Access Control.
IEEE 802.11e QoS	IEEE 802.11 e Wireless LAN for Quality of Service
ANSI T1.413, Issue 2	Asymmetric Digital Subscriber Line (ADSL) standard.
G dmt(G.992.1)	G.992.1 Asymmetrical Digital Subscriber Line (ADSL) Transceivers
ITU G.992.1 (G.DMT)	ITU standard for ADSL using discrete multitone modulation.
ITU G.992.2 (G. Lite)	ITU standard for ADSL using discrete multitone modulation.
ITU G.992.3 (G.dmt.bis)	ITU standard (also referred to as ADSL2) that extends the capability of basic ADSL in data rates.
ITU G.992.3 (G.lite.bis)	ITU standard (also referred to as ADSL2) that extends the capability of basic ADSL in data rates.
ITU G.992.5 (ADSL2+)	ITU standard (also referred to as ADSL2+) that extends the capability of basic ADSL by doubling the number of downstream bits.
1.363.5	Compliant AAL5 SAR (Segmentation And Re-assembly)

## 58.4 Default Settings

This section lists the default configuration of the IES-612-51.

**Table 169** Default Settings

<b>Default Login Settings</b>		
Default IP Address	192.168.1.1	
Default Subnet Mask	255.255.255.0 (24 bits)	
Default User Name	admin	
Default Password	1234	
<b>ADSL Default Settings</b>		
Enable/Disable State:	Enabled	
Operational Mode:	auto	
(DSL) Port Profile Default Settings		
Name:	DEFVAL_MAX (Factory Default)	
Profile Status:	Active	
Latency Mode:	Interleave	
	Upstream ADSL Settings:	Downstream ADSL Settings:
Max Rate	512 Kbps	2048 Kbps
Min Rate	64 Kbps	64 Kbps
Latency Delay	4 ms	4 ms
Max SNR	31 db	31 db

**Table 169** Default Settings (continued)

Min SNR	0 db	0 db
Target SNR	6 db	6 db
Up Shift Margin	9 db	9 db
Down Shift Margin	3 db	3 db
Name:	DEFVAL (Factory Default)	
Profile Status:	Active	
Latency Mode:	Interleave	
	Upstream ADSL Settings:	Downstream ADSL Settings:
Max Rate	512 Kbps	9088 Kbps
Min Rate	64 Kbps	64 Kbps
Latency Delay	4 ms	4 ms
Max Margin	31 db	31 db
Min Margin	0 db	0 db
Target Margin	6 db	6 db
Up Shift Margin	9 db	9 db
Down Shift Margin	3 db	3 db
<b>Virtual Channel Default Settings<sup>A</sup>.</b>		
Super channel:	Enabled	
VPI:	0	
VCI:	33	
VC Profile:	DEFVAL (factory default)	
Default VC Profile Settings		
DEFVAL Profile Settings		
Encapsulation:	RFC 2684	
Multiplexing:	LLC-based	
Traffic Class:	UBR	
PCR:	300000 cells/second	
CDVT:	0	
DEFVAL_VC Profile Settings		
Encapsulation:	RFC 2684	
Multiplexing:	VC-based	
Traffic Class:	UBR	
PCR:	300000 cells/second	
CDVT:	0	
Default IGMP Filter Profile Settings	The <b>DEFVAL</b> IGMP filter profile is assigned to all of the DSL ports by default. It allows a port to join all multicast IP addresses (224.0.0.0~239.255.255.255).	

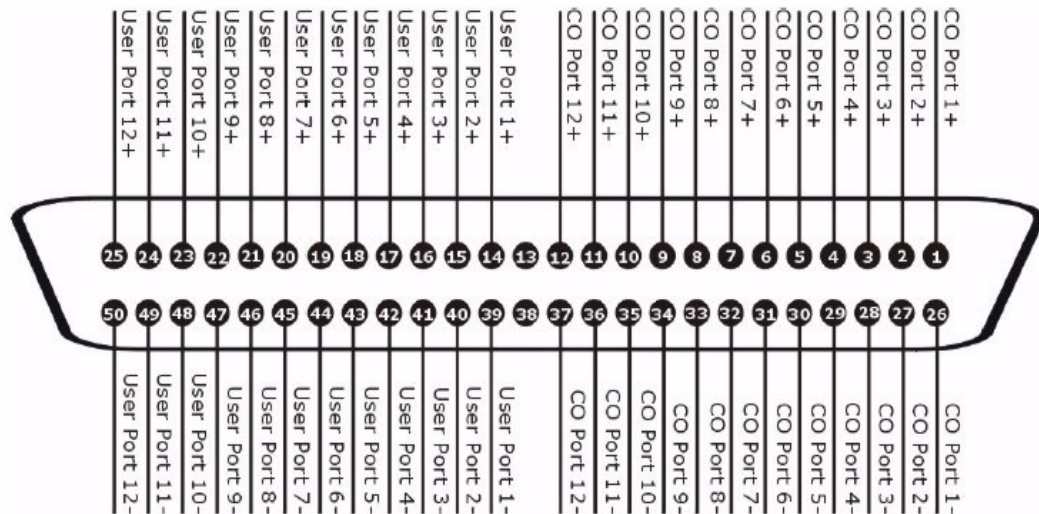


- A. The IES-612-51 DSL ports' PVCs use ATM Adaptation Layer (AAL) 5.

## 58.5 Hardware Telco-50 Connector Pin Assignments

The following diagram shows the pin assignments of the Telco-50 connector.

**Figure 210** Telco-50 Pin Assignments



This table lists the ports and matching pin numbers for the hardware Telco-50 connector.

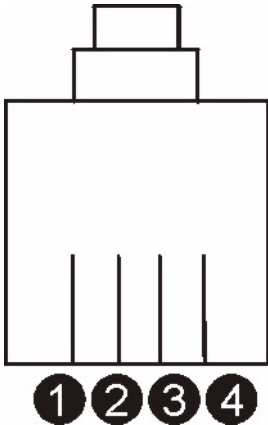
**Table 170** Hardware Telco-50 Connector Port and Pin Numbers

PORT NUMBER	PIN NUMBER
1	USER (14, 39), CO (1, 26)
2	USER (15, 40), CO (2, 27)
3	USER (16, 41), CO (3, 28)
4	USER (17, 42), CO (4, 29)
5	USER (18, 43), CO (5, 30)
6	USER (19, 44), CO (6, 31)
7	USER (20, 45), CO (7, 32)
8	USER (21, 46), CO (8, 33)
9	USER (22, 47), CO (9, 34)
10	USER (23, 48), CO (10, 35)
11	USER (24, 49), CO (11, 36)
12	USER (25, 50), CO (12, 37)

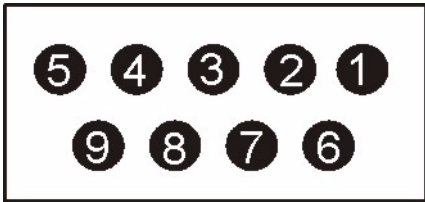
## 58.6 Console Cable Pin Assignments

The following diagrams and chart show the pin assignments of the console cable.

**Figure 211** Console Cable RJ-11 Male Connector



**Figure 212** Console Cable DB-9 Female Connector



**Table 171** Console Cable Connector Pin Assignments

RJ-11 MALE	DB-9 FEMALE
Pin 2: TXD	Pin 2
Pin 3: RXD	Pin 3
Pin 4: GND	Pin 5

---

# PART VII

## Appendices and Index

---



---

The appendices provide general information. Some details may not apply to your IES-612-51.

---

[Changing a Fuse \(397\)](#)

[Legal Information \(399\)](#)

[Customer Support \(403\)](#)

[Index \(409\)](#)



# Changing a Fuse

This appendix shows you how to remove and install fuses for the IES-612-51 (DC model only).



If you use a fuse other than an included fuse, make sure it matches the fuse specifications in the appendix on product specifications.

## Removing a Fuse



Disconnect all power from the IES-612-51 before you begin this procedure.

- 1 Remove the power cord from the IES-612-51.
- 2 See the product specifications for the location of the fuse. Use a small flat-head screwdriver to carefully pry out the fuse housing.
- 3 A burnt-out fuse is blackened, darkened or cloudy inside its glass casing. A working fuse has a completely clear glass casing. Pull gently, but firmly, to remove the burnt out fuse from the fuse housing. Dispose of the burnt-out fuse properly.

## Installing a Fuse

- 1 The IES-612-51 is shipped from the factory with one spare fuse included in a box-like section of the fuse housing. Push the middle part of the box-like section to access the spare fuse. Put another spare fuse in its place in order to always have one on hand.
- 2 Push the replacement fuse into the fuse housing until you hear a click.
- 3 Push the fuse housing back into the IES-612-51 until you hear a click.
- 4 Plug the power cord back into the unit.



# Legal Information

## Copyright

Copyright © 2007 by ZyXEL Communications Corporation.

The contents of this publication may not be reproduced in any part or as a whole, transcribed, stored in a retrieval system, translated into any language, or transmitted in any form or by any means, electronic, mechanical, magnetic, optical, chemical, photocopying, manual, or otherwise, without the prior written permission of ZyXEL Communications Corporation.

Published by ZyXEL Communications Corporation. All rights reserved.

## Disclaimer

ZyXEL does not assume any liability arising out of the application or use of any products, or software described herein. Neither does it convey any license under its patent rights nor the patent rights of others. ZyXEL further reserves the right to make changes in any products described herein without notice. This publication is subject to change without notice.

## Trademarks

ZyNOS (ZyXEL Network Operating System) is a registered trademark of ZyXEL Communications, Inc. Other trademarks mentioned in this publication are used for identification purposes only and may be properties of their respective owners.

## Certifications

### Federal Communications Commission (FCC) Interference Statement

This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operations.

### **FCC Warning**

This device has been tested and found to comply with the limits for a Class A digital switch, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **CE Mark Warning:**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### **Taiwanese BSMI (Bureau of Standards, Metrology and Inspection) A Warning:**

警告使用者  
這是甲類的資訊產品，在居住的環境使用時，  
可能造成射頻干擾，在這種情況下，  
使用者會被要求採取某些適當的對策。

### **Notices**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### **Viewing Certifications**

- 1 Go to <http://www.zyxel.com>.
- 2 Select your product on the ZyXEL home page to go to that product's page.
- 3 Select the certification you wish to view from this page.

## **ZyXEL Limited Warranty**

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal or higher value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product has been modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.



**Note**

Repair or replacement, as provided under this warranty, is the exclusive remedy of the purchaser. This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular use or purpose. ZyXEL shall in no event be held liable for indirect or consequential damages of any kind to the purchaser.

To obtain the services of this warranty, contact ZyXEL's Service Center for your Return Material Authorization number (RMA). Products must be returned Postage Prepaid. It is recommended that the unit be insured when shipped. Any returned products without proof of purchase or those with an out-dated warranty will be repaired or replaced (at the discretion of ZyXEL) and the customer will be billed for parts and labor. All repaired or replaced products will be shipped by ZyXEL to the corresponding return address, Postage Paid. This warranty gives you specific legal rights, and you may also have other rights that vary from country to country.

**Registration**

Register your product online to receive e-mail notices of firmware upgrades and information at [www.zyxel.com](http://www.zyxel.com) for global products, or at [www.us.zyxel.com](http://www.us.zyxel.com) for North American products.



# Customer Support

Please have the following information ready when you contact customer support.

## Required Information

- Product model and serial number.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

“+” is the (prefix) number you dial to make an international telephone call.

## Corporate Headquarters (Worldwide)

- Support E-mail: [support@zyxel.com.tw](mailto:support@zyxel.com.tw)
- Sales E-mail: [sales@zyxel.com.tw](mailto:sales@zyxel.com.tw)
- Telephone: +886-3-578-3942
- Fax: +886-3-578-2439
- Web: [www.zyxel.com](http://www.zyxel.com), [www.europe.zyxel.com](http://www.europe.zyxel.com)
- FTP: [ftp.zyxel.com](ftp://ftp.zyxel.com), [ftp.europe.zyxel.com](ftp://ftp.europe.zyxel.com)
- Regular Mail: ZyXEL Communications Corp., 6 Innovation Road II, Science Park, Hsinchu 300, Taiwan

## Costa Rica

- Support E-mail: [soporte@zyxel.co.cr](mailto:soporte@zyxel.co.cr)
- Sales E-mail: [sales@zyxel.co.cr](mailto:sales@zyxel.co.cr)
- Telephone: +506-2017878
- Fax: +506-2015098
- Web: [www.zyxel.co.cr](http://www.zyxel.co.cr)
- FTP: [ftp.zyxel.co.cr](ftp://ftp.zyxel.co.cr)
- Regular Mail: ZyXEL Costa Rica, Plaza Roble Escazú, Etapa El Patio, Tercer Piso, San José, Costa Rica

## Czech Republic

- E-mail: [info@cz.zyxel.com](mailto:info@cz.zyxel.com)
- Telephone: +420-241-091-350
- Fax: +420-241-091-359
- Web: [www.zyxel.cz](http://www.zyxel.cz)

- Regular Mail: ZyXEL Communications, Czech s.r.o., Modranská 621, 143 01 Praha 4 - Modrany, Česká Republika

### **Denmark**

- Support E-mail: support@zyxel.dk
- Sales E-mail: sales@zyxel.dk
- Telephone: +45-39-55-07-00
- Fax: +45-39-55-07-07
- Web: www.zyxel.dk
- Regular Mail: ZyXEL Communications A/S, Columbusvej, 2860 Soeborg, Denmark

### **Finland**

- Support E-mail: support@zyxel.fi
- Sales E-mail: sales@zyxel.fi
- Telephone: +358-9-4780-8411
- Fax: +358-9-4780-8448
- Web: www.zyxel.fi
- Regular Mail: ZyXEL Communications Oy, Malminkaari 10, 00700 Helsinki, Finland

### **France**

- E-mail: info@zyxel.fr
- Telephone: +33-4-72-52-97-97
- Fax: +33-4-72-52-19-20
- Web: www.zyxel.fr
- Regular Mail: ZyXEL France, 1 rue des Vergers, Bat. 1 / C, 69760 Limonest, France

### **Germany**

- Support E-mail: support@zyxel.de
- Sales E-mail: sales@zyxel.de
- Telephone: +49-2405-6909-69
- Fax: +49-2405-6909-99
- Web: www.zyxel.de
- Regular Mail: ZyXEL Deutschland GmbH., Adenauerstr. 20/A2 D-52146, Wuerselen, Germany

### **Hungary**

- Support E-mail: support@zyxel.hu
- Sales E-mail: info@zyxel.hu
- Telephone: +36-1-3361649
- Fax: +36-1-3259100
- Web: www.zyxel.hu
- Regular Mail: ZyXEL Hungary, 48, Zoldlomb Str., H-1025, Budapest, Hungary

**India**

- Support E-mail: [support@zyxel.in](mailto:support@zyxel.in)
- Sales E-mail: [sales@zyxel.in](mailto:sales@zyxel.in)
- Telephone: +91-11-30888144 to +91-11-30888153
- Fax: +91-11-30888149, +91-11-26810715
- Web: <http://www.zyxel.in>
- Regular Mail: India - ZyXEL Technology India Pvt Ltd., II-Floor, F2/9 Okhla Phase -1, New Delhi 110020, India

**Japan**

- Support E-mail: [support@zyxel.co.jp](mailto:support@zyxel.co.jp)
- Sales E-mail: [zyp@zyxel.co.jp](mailto:zyp@zyxel.co.jp)
- Telephone: +81-3-6847-3700
- Fax: +81-3-6847-3705
- Web: [www.zyxel.co.jp](http://www.zyxel.co.jp)
- Regular Mail: ZyXEL Japan, 3F, Office T&U, 1-10-10 Higashi-Gotanda, Shinagawa-ku, Tokyo 141-0022, Japan

**Kazakhstan**

- Support: <http://zyxel.kz/support>
- Sales E-mail: [sales@zyxel.kz](mailto:sales@zyxel.kz)
- Telephone: +7-3272-590-698
- Fax: +7-3272-590-689
- Web: [www.zyxel.kz](http://www.zyxel.kz)
- Regular Mail: ZyXEL Kazakhstan, 43 Dostyk Ave., Office 414, Dostyk Business Centre, 050010 Almaty, Republic of Kazakhstan

**Malaysia**

- Support E-mail: [support@zyxel.com.my](mailto:support@zyxel.com.my)
- Sales E-mail: [sales@zyxel.com.my](mailto:sales@zyxel.com.my)
- Telephone: +603-8076-9933
- Fax: +603-8076-9833
- Web: <http://www.zyxel.com.my>
- Regular Mail: ZyXEL Malaysia Sdn Bhd., 1-02 & 1-03, Jalan Kenari 17F, Bandar Puchong Jaya, 47100 Puchong, Selangor Darul Ehsan, Malaysia

**North America**

- Support E-mail: [support@zyxel.com](mailto:support@zyxel.com)
- Support Telephone: +1-800-978-7222
- Sales E-mail: [sales@zyxel.com](mailto:sales@zyxel.com)
- Sales Telephone: +1-714-632-0882
- Fax: +1-714-632-0858
- Web: [www.zyxel.com](http://www.zyxel.com)

- Regular Mail: ZyXEL Communications Inc., 1130 N. Miller St., Anaheim, CA 92806-2001, U.S.A.

### **Norway**

- Support E-mail: [support@zyxel.no](mailto:support@zyxel.no)
- Sales E-mail: [sales@zyxel.no](mailto:sales@zyxel.no)
- Telephone: +47-22-80-61-80
- Fax: +47-22-80-61-81
- Web: [www.zyxel.no](http://www.zyxel.no)
- Regular Mail: ZyXEL Communications A/S, Nils Hansens vei 13, 0667 Oslo, Norway

### **Poland**

- E-mail: [info@pl.zyxel.com](mailto:info@pl.zyxel.com)
- Telephone: +48-22-333 8250
- Fax: +48-22-333 8251
- Web: [www.pl.zyxel.com](http://www.pl.zyxel.com)
- Regular Mail: ZyXEL Communications, ul. Okrzei 1A, 03-715 Warszawa, Poland

### **Russia**

- Support: <http://zyxel.ru/support>
- Sales E-mail: [sales@zyxel.ru](mailto:sales@zyxel.ru)
- Telephone: +7-095-542-89-29
- Fax: +7-095-542-89-25
- Web: [www.zyxel.ru](http://www.zyxel.ru)
- Regular Mail: ZyXEL Russia, Ostrovityanova 37a Str., Moscow 117279, Russia

### **Singapore**

- Support E-mail: [support@zyxel.com.sg](mailto:support@zyxel.com.sg)
- Sales E-mail: [sales@zyxel.com.sg](mailto:sales@zyxel.com.sg)
- Telephone: +65-6899-6678
- Fax: +65-6899-8887
- Web: <http://www.zyxel.com.sg>
- Regular Mail: ZyXEL Singapore Pte Ltd., No. 2 International Business Park, The Strategy #03-28, Singapore 609930

### **Spain**

- Support E-mail: [support@zyxel.es](mailto:support@zyxel.es)
- Sales E-mail: [sales@zyxel.es](mailto:sales@zyxel.es)
- Telephone: +34-902-195-420
- Fax: +34-913-005-345
- Web: [www.zyxel.es](http://www.zyxel.es)
- Regular Mail: ZyXEL Communications, Arte, 21 5ª planta, 28033 Madrid, Spain

**Sweden**

- Support E-mail: support@zyxel.se
- Sales E-mail: sales@zyxel.se
- Telephone: +46-31-744-7700
- Fax: +46-31-744-7701
- Web: www.zyxel.se
- Regular Mail: ZyXEL Communications A/S, Sjöporten 4, 41764 Göteborg, Sweden

**Thailand**

- Support E-mail: support@zyxel.co.th
- Sales E-mail: sales@zyxel.co.th
- Telephone: +662-831-5315
- Fax: +662-831-5395
- Web: http://www.zyxel.co.th
- Regular Mail: ZyXEL Thailand Co., Ltd., 1/1 Moo 2, Ratchaphruk Road, Bangrak-Noi, Muang, Nonthaburi 11000, Thailand.

**Ukraine**

- Support E-mail: support@ua.zyxel.com
- Sales E-mail: sales@ua.zyxel.com
- Telephone: +380-44-247-69-78
- Fax: +380-44-494-49-32
- Web: www.ua.zyxel.com
- Regular Mail: ZyXEL Ukraine, 13, Pimonenko Str., Kiev 04050, Ukraine

**United Kingdom**

- Support E-mail: support@zyxel.co.uk
- Sales E-mail: sales@zyxel.co.uk
- Telephone: +44-1344-303044, 08707-555779 (UK only)
- Fax: +44-1344-303034
- Web: www.zyxel.co.uk
- FTP: ftp.zyxel.co.uk
- Regular Mail: ZyXEL Communications UK Ltd., 11 The Courtyard, Eastern Road, Bracknell, Berkshire RG12 2XB, United Kingdom (UK)





# Index

## Numerics

1 Day Performance Command [343](#), [347](#), [348](#)  
 15 Minute Performance Command [342](#)

## A

Access Control [225](#)  
 accessing the CLI [257](#)  
 actual rate [108](#)  
 Address Resolution Protocol. See ARP.  
 ADSL Port Setup [107](#), [125](#)  
 ADSL Profile Delete Command [336](#)  
 ADSL Profile Map Command [336](#)  
 ADSL Profile Set Command [335](#)  
 ADSL Profile Show Command [335](#)  
 ADSL profiles [107](#)  
   default [109](#)  
 ADSL standard [138](#)  
 ADSL Tel Command [330](#)  
 aging time [100](#)  
 Alarm Profile Screen [133](#)  
 all digital mode [113](#)  
 ALM LED  
   troubleshooting [375](#)  
 Annex I [113](#)  
 Annex L [113](#)  
 Annex M [113](#)  
 ARP [172](#), [247](#)  
   table [247](#)  
 ARP Show Command [318](#)  
 ATM F5 [242](#)  
 ATM Forum Traffic Management 4.0 Specification [128](#)  
 ATM QoS [127](#)  
 ATM traffic class [128](#), [132](#)  
 Attainable Net Data Rate [349](#)  
 authentication [94](#)  
   default privilege level for administrators [95](#)  
   modes for administrators [95](#)  
   user [94](#)

## B

back up configuration [239](#)  
 bit allocation [142](#)  
 Bridge Protocol Data Units (BPDU) [176](#)  
 Burst Tolerance (BT) [130](#)

## C

Canonical Format Indicator (CFI) [145](#)  
 Cell Delay Variation Tolerance (CDVT) [129](#)  
 certifications [399](#)  
   notices [400](#)  
   viewing [400](#)  
 Channel Characteristics Function [349](#)  
 CLI Command  
   Configure tagged VLAN example [291](#)  
   Static VLAN Table example [290](#)  
 Command  
   Forwarding Process Example [290](#)  
 command interface [43](#)  
 Commands [325](#), [353](#)  
   multicast mvlan disable [306](#)  
   multicast mvlan group set [307](#)  
   multicast mvlan show [307](#)  
   port tispvc show [368](#)  
   show igmp port group [305](#)  
   show igmp port info [305](#)  
 configuration  
   back up [239](#)  
   restore [238](#)  
 configured rate [108](#)  
 console port [383](#)  
   pin assignments [393](#)  
   settings [50](#)  
 console port (accessing the CLI) [257](#)  
 Constant Bit Rate (CBR) [128](#)  
 contact information [403](#)  
 contact person's name [91](#)  
 copyright [399](#)  
 Crosstalk [349](#)  
 customer support [403](#)

## D

- Daytime (RFC 867) [92](#)
- default gateway [103](#)
- Default IP Address [318](#)
- default privilege level [95](#)
- DEFVAL [116](#)
- DEFVAL profile settings [391](#)
- DEFVAL\_VC [116](#)
- Delete Virtual Channel Profile Command [355](#)
- DHCP [172](#), [187](#)
- DHCP relay [187](#)
  - option 82 [187](#)
- Diagnostic [241](#)
- disclaimer [399](#)
- Discrete Multi-Tone. See DMT.
- DMT [141](#)
- double upstream mode [113](#)
- Double-tagged Frames [367](#)
- double-tagged frames [211](#)
- Downstream (ds) [340](#)
- downstream (traffic) [107](#)
- DSL LED
  - troubleshooting [377](#)
- DSL port statistics [79](#)
- duplex [105](#)
- Dynamic Host Configuration Protocol. See DHCP.

## E

- EAPoL [172](#)
- Earthing Terminal [48](#)
- encapsulation
  - LLC [116](#)
  - VC Mux [116](#)
- Errored Seconds (ES) [140](#)
- Ethernet address. See MAC address.
- Ethernet port
  - default settings [50](#)
  - statistics [77](#)
- Extensible Authentication Protocol. See EAPoL.

## F

- factory defaults [239](#), [381](#)
- Far End Actual Aggregate Transmit Power [349](#)
- Far End Block Errors (FEBE) [140](#)

- fast channel [108](#)
- fast mode [108](#), [126](#)
- FCC interference statement [399](#)
- Filtering Databases [287](#)
- firmware upgrade [237](#)
  - when unable to use FTP [383](#)
- firmware version [88](#)
- Frame Ground [48](#)
- Frame Ground Wire [48](#)
- front panel [49](#)
- FTP [43](#), [240](#)
- full duplex [105](#)
- fuse [397](#)
  - replacement [397](#)

## G

- GARP [97](#)
- GARP timer [100](#)
- GARP timer setup [97](#)
- General IP Commands [317](#)
- General Setup [91](#)
- Generic Attribute Registration Protocol. See GARP.
- Green-and-yellow [48](#)

## H

- help (in the CLI) [260](#)
- Home screen [62](#), [75](#)
- host name [91](#)

## I

- IEEE 802.1D. See STP.
- IEEE 802.1Q Tagged VLAN [287](#)
- IEEE 802.1Q. See VLAN.
- IEEE 802.1w. See RSTP.
- IEEE 802.1x [181](#), [183](#)
- IEEE 802.1x. See also RADIUS.
- IGMP [172](#)
  - leave packets [155](#)
  - modes [158](#)
  - query packets [155](#)
  - report packets [155](#)
- IGMP Count [303](#)

IGMP Filter Profile Delete Command [301](#)  
 IGMP Filter Profile Screen [135](#)  
 IGMP Filter Profile Set Command [301](#)  
 IGMP Filter Profile Show Command [301](#)  
 IGMP Filter Set Command [300](#)  
 IGMP Filter Show Command [300](#), [302](#)  
 IGMP snooping [153](#)  
 initial configuration [69](#)  
 install  
   fuse [397](#)  
 Installation  
   Rack-Mounted [47](#)  
 Installation Requirements [46](#)  
 Interleave Delay [340](#)  
 interleave delay [108](#), [126](#)  
 interleave mode [126](#)  
 Internet Explorer [61](#), [69](#)  
 Internet Group Multicast Protocol. See IGMP.  
 Internet Protocol. See IP.  
 IP [172](#)  
 IP Commands [317](#)  
 IP Settings [318](#)  
 IP Setup [103](#)  
 Isolation Disable Command [265](#)  
 Isolation Enable Command [265](#)  
 Isolation Show Command [265](#)

## L

LAN LED  
   troubleshooting [376](#)  
 latency mode [126](#)  
 LDM test [242](#)  
 Line Attenuation [349](#)  
 line bit allocation [337](#)  
 Line Data [140](#)  
 line operating values [137](#)  
 Line Performance [138](#)  
 line type [140](#)  
 Linedata Command [339](#), [344](#)  
 Lineperf Command [340](#)  
 LLC [116](#)  
 location [91](#)  
 Log Format [279](#)  
 logging out [66](#)  
 login [258](#)  
 Login screen [62](#)  
 loopback test [242](#)

## M

MAC address [88](#)  
 MAC address learning [100](#)  
 MAC Commands [295](#)  
 MAC Count [297](#), [298](#)  
 MAC Count Disable Command [298](#)  
 MAC Count Enable Command [297](#)  
 MAC Count Set Command [298](#)  
 MAC Count Show Command [297](#)  
 MAC Filter  
   Filter [295](#)  
 MAC filter [173](#)  
 MAC Filter Delete Command [296](#)  
 MAC Filter Disable Command [296](#)  
 MAC Filter Enable Command [296](#)  
 MAC Filter Set Command [296](#)  
 MAC Filter Show Command [296](#)  
 Management Information Base (MIB) [226](#)  
 managing the device  
   good habits [43](#)  
   using FTP. See FTP.  
   using SMT. See SMT.  
   using SNMP. See SNMP.  
   using Telnet. See command interface.  
   using the command interface. See command interface.  
   using the web configurator. See web configurator.  
 Maximum Burst Size (MBS) [129](#)  
 Media Access Control. See MAC address.  
 metric [236](#)  
 model [92](#)  
 Mounting Brackets [47](#)  
 multicast MAC address [164](#)  
 multicast mvlan Commands [305](#)  
 Multicast VLAN [306](#)  
 Multicast VLAN. See MVLAN.  
 MVLAN [165](#), [306](#)

## N

Near End Block Errors (NEBE) [140](#)  
 NetBIOS [172](#)  
 Network Basic Input/Output System. See NetBIOS.  
 non real-time Variable Bit Rate (nrt-VBR) [128](#)  
 NTP (RFC-1305) [92](#)

## O

OAM F5 Loopback [242](#)  
Operational Mode [337](#)  
option 82 [187](#)

## P

packet filter [171](#)  
Packet Filter PPPoE Only Command [311](#)  
Packet Filter Set Command [311](#)  
Packet Filter Show Command [310](#)  
PAE [364](#)  
password [65](#)  
Peak Cell Rate (PCR) [129](#)  
Permanent Virtual Circuit. See PVC.  
Philips Screwdriver, #2 [46](#)  
ping [242](#)  
PMM [243](#)  
Point-to-Point Protocol over Ethernet. See PPPoE.  
Port Security [185](#)  
Port Setup [105](#)  
Port Statistics [266](#)  
Port VLAN ID. See PVID.  
PPPoA to PPPoE (PAE) [364](#)  
PPPoE [172](#)  
PPVC Setup [121](#)  
PPVC Setup Members [122](#)  
priority queue assignment [101](#)  
product registration [401](#)  
Protective Earthing Terminal [48](#)  
PVC [115](#)  
PVC Channels [356](#)  
PVID [118](#)  
    default [146](#)

## Q

Q-in-Q [367](#)  
Q-in-Q. See TLS.  
Quality of Service (QoS) [127](#)  
Quiet Line Noise [349](#)

## R

Rack [46](#)  
Rack-mounted Installation Requirements [46](#)  
RADIUS [181](#)  
    shared secret [182](#)  
RADIUS Setup [182](#)  
Rapid Spanning Tree Protocol. See RSTP.  
reach extended ADSL2 [113](#)  
real-time Variable Bit Rate (rt-VBR) [128](#)  
reboot [240](#)  
Reed-Solomon [108](#), [126](#)  
registration  
    product [401](#)  
related documentation [3](#)  
Remote Authentication Dial In User Service. See RADIUS.  
Remote Management screen [230](#)  
removing fuses [397](#)  
restart [240](#)  
restore configuration [238](#)  
RFC 1305. See NTP.  
RFC 2131. See DHCP.  
RFC 2132. See DHCP.  
RFC 2138. See RADIUS.  
RFC 2139. See RADIUS.  
RFC 2486. See EAPoL.  
RFC 3046. See Option 82.  
RFC 867. See Daytime.  
RFC 868. See Time.  
Route Show Command [318](#)  
RSTP [175](#)  
    port states [176](#)  
    See also STP.

## S

safety warnings [6](#)  
save configuration [66](#)  
saving configuration [261](#)  
Screwdriver [46](#)  
Secured Client Setup screen [230](#)  
SELT [242](#)  
Service Access Control [229](#)  
Service Provider's Network (SPN) [211](#)  
Set PVC Command [356](#)  
Set Virtual Channel Profile Command [355](#)  
Severely Errored Seconds (SES) [140](#)

shared secret [95](#)  
 shortcuts [260](#)  
 Signal Attenuation [349](#)  
 Signal-to-Noise Ratio [349](#)  
 Signal-to-Noise Ratio Margin [349](#)  
 Simple Network Management Protocol. See SNMP.  
 Single End Loop Test. See SELT.  
 SMT [43](#)  
 SNMP [43](#), [225](#)  
   commands [226](#)  
   Configuring [323](#)  
   Get [226](#)  
   GetNext [226](#)  
   manager [226](#)  
   MIBs [227](#)  
   supported versions [225](#)  
   Trap [226](#)  
   traps [227](#)  
 SNMP screen [228](#)  
 Spanning Tree Protocol. See STP.  
 specifications [385](#)  
 SSH (accessing the CLI) [258](#)  
 static multicast filter [163](#)  
 static route [235](#)  
   metric [236](#)  
 statistics  
   DSL port [79](#)  
   Ethernet port [77](#)  
 Statistics IP Command [319](#)  
 Statistics Port [266](#)  
 STP [175](#)  
   Bridge Protocol Data Units (BPDU) [176](#)  
   designated bridge [175](#)  
   hello time [176](#)  
   max age [176](#)  
   path cost [175](#)  
   port path cost [180](#)  
   port priority [180](#)  
   port states [176](#)  
   root bridge [175](#)  
   root port [175](#)  
 super channel [115](#)  
 Sustained Cell Rate (SCR) [129](#)  
 SVLAN Table [287](#)  
 Switch Setup [99](#)  
 syntax conventions [4](#)  
 SYS LED  
   troubleshooting [375](#)  
 syslog [223](#)  
 System Information [87](#)  
 system log [242](#)  
 System Management Terminal  
   see SMT

system up time [75](#)

## T

Tag Control Information (TCI) [145](#)  
 Tag Protocol Identifier (TPID) [145](#)  
 tagged VLAN. See VLAN.  
 telco-50 connector  
   pin assignments [393](#)  
 Telnet (accessing the CLI) [257](#)  
 temperature [88](#)  
 terminal emulation [383](#)  
 Theoretical Arrival Time (TAT) [130](#)  
 Time (RFC-868) [92](#)  
 time server protocols supported [92](#)  
 time zone [92](#)  
 TLS [211](#), [367](#)  
 ToneDiag [243](#)  
 tones [141](#)  
 trademarks [399](#)  
 traffic parameters [128](#)  
 traffic shaping [128](#)  
 transmission error correction [108](#), [126](#)  
 Transparent LAN Service (TLS) [367](#)  
 Transparent LAN Service. See TLS.  
 Trellis encoding [138](#)  
 troubleshooting [375](#)

## U

UnAvailable Seconds (UAS) [140](#)  
 UNIX syslog [223](#)  
 Unspecified Bit Rate (UBR) [128](#)  
 up time [76](#)  
 upstream (traffic) [107](#)  
 Upstream (us) [340](#)  
 User Account [93](#)

## V

Variable Bit Rate (VBR) [128](#)  
 VC [116](#)  
 VC Mux [116](#)  
 VC Profile Screen [131](#)

- VC Setup [116](#)
- vendor information [138](#)
- ventilation holes [47](#)
- virtual channel [115](#)
  - downstream profile [117](#)
  - profile [116](#)
  - upstream profile [118](#)
- Virtual Channel Profile Commands [354](#)
- Virtual Circuit Identifier (VCI)
- Virtual Circuit. See VC.
- Virtual Local Area Network. See VLAN.
- Virtual Path Identifier (VPI)
- VLAN [145](#)
  - Explicit Tagging [287](#)
  - forwarding [146](#)
  - Implicit Tagging [287](#)
  - priority frame [146](#)
  - Registration Information [287](#)
  - VLAN ID [145](#)
  - VLAN ID, maximum number of [145](#)
  - when VLAN ID is zero [146](#)
- VLAN Delete Command [291](#)
- VLAN Stacking [367](#)
- VLAN stacking [367](#)
- VLAN stacking. See TLS.
- vlan1q port default VID [289](#)
- vlan1q port status [292](#)
- vlan1q svlan setentry [290](#)
- voltage [88](#)

## W

- warranty [400](#)
  - note [401](#)
- web configurator [43](#)

## X

- XMODEM upload [382](#), [383](#)